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LIVERPOOL AND MANCHESTER MEDICAL AND SURGICAL REPORTS.

NOTES ON CASES OF FRACTURE, WITH DISPLACEMENT OF THE SPINE, SUCCESSFULLY TREATED BY EXTENSION.

By T. GULSTON WOLLASTON, M.D.,
HONORARY SURGEON TO THE LIVERPOOL ROYAL SOUTHERN HOSPITAL.

I AM induced to submit the following cases to the readers of the 'Liverpool and Manchester Medical and Surgical Reports,' under the impression that many surgeons are too apt to treat such accidents on the "do nothing" principle, and I trust that a perusal of the following condensed notes may tend to prove that benefit may, in some cases, be derived by the mode adopted; it can do no harm, and in such fearfully wretched cases, as every surgeon knows who has had to treat them, the least hope of ameliorating the patient's subsequent sufferings should be embraced.

Judging from the amount of deformity in each of the three following cases, we may safely infer that the pressure on the cord must have been very great, though probably no actual rupture took place. The necessity also for the relief of this pressure at the very earliest period possible is obvious, for if allowed to exist any length of time, our endeavours will be futile; in each instance reduction was effected under an hour from the receipt of the injury.

With regard to the mode of reduction the plan employed was as follows :—The patient was placed on a mattress on the floor, and chloroform given fully; a well-padded strap, passed across the back of the shoulders, and the ends brought under the arms and in front of the clavicles and secured to a ring-bolt in the floor, was sufficient to fix the upper portion of the body, the arms, of course, being at the same time confined to the side.

A soft, double strap was buckled round the lower portion of each thigh, and the hook of the pulleys applied to the centre of this. By means of this arrangement, the position of the patient can be altered at will, and manipulation rendered much more easy.

If the displaced bones can be got back into their original position, all that is necessary is to place a firm pad over the seat of injury, secured by strips of Empl. Roborans; it may be advisable to order the patient to lie on a small, narrow pillow placed in the direction of the spinal column.

If it were necessary to keep up extension for any length of time, it might readily be effected by securing the upper portion of the body by means of axillary bands to the bedposts, and fixing the lower extremities with weights and pulleys, as in an ordinary case of fracture of the femur.

If reduction has been properly effected, it will be found that the parts become firmly welded together in the course of five or six weeks, and that no apparatus will be required to be worn.

In the treatment of the subsequent bladder trouble, I have found Holt's winged catheters of the greatest possible advantage, combined with the internal administration of strychnine, either in the ordinary mode or in the form of Easton's syrup.

J. M—, æt. 36, while in a state of intoxication, walked over one of the pier heads and fell on the river bed below, a distance of forty feet. In this position he remained for four hours, until roused by the advancing tide. He was hoisted up by ropes and carried on a stretcher to the hospital.

On admission, Nov. 18th, he was unable to stand, and complained of intense pain from the toes of both feet up to the hips, and also of a feeling of stiffness in the back. On examining the back, there was considerable ecchymosis over the lower portion of the dorsal region, and the eleventh dorsal vertebra was displaced and protruded fully an inch and a half out of its normal position. No crepitus could be felt. Hyperæsthesia of the lower extremities existed in a most marked degree, a breath of air or the slightest touch of a feather causing the most excruciating agony. Without any stimulus, paroxysms of pain came on every three or four minutes, commencing at the plantar base of the toes. There was neither paraplegia or priapism.

Treatment.—The patient being placed on a mattress on the floor, chloroform was administered to its full extent. The shoulders were then securely fixed, and the pulleys applied to both thighs. During extension the hand, placed over the projecting part of the spine, felt the displacement gradually disappear, but without crepitus or jerk. Hot-water bottles were applied to the feet, a dose of tincture of opium given, the catheter passed, and the patient desired to lie on his back. A pad of lint was placed over the injured part and firmly secured with plaster.

Nov. 19th.—Restless night, the attacks of pain being very severe with only very short intervals. Although he has been tossing from side to side no displacement has occurred, but a slight "dip" is felt at the seat of injury. The plaster was readjusted, one third of a grain of morphia was injected into the calf of one leg, and both lower extremities elevated on pillows. Catheter necessary. Towards evening, as no relief had been experienced, the injection was repeated in the other leg and with immediate benefit. Temperature, upper extremity 97°, lower 98·5°; pulse 98.

20th.—Better; pain in legs not so intense unless touched; abdomen tympanitic, and he is unable to pass flatus; little or no pain at seat of injury; great thirst and constant vomiting. Urine loaded with mucus and highly ammoniacal. Ordered iced milk; morphia injection repeated. Catheter thrice daily. Temperature, upper 97·6°, lower 98·4°; pulse 96; respirations 20.

21st.—Easier; still very sick. Two turpentine and oil enemata have been given without effect. Discontinue morphia injection, and take only iced soda water and milk. Temperature, upper 99·2°, lower 96·8°; pulse 98; respirations 18.

22nd.—The same; bowels acted, but he is not aware of it; vomiting continues; towards evening pain more severe; hypodermic injection repeated. Ordered a purgative by the mouth. Temperature, upper 99·8°, lower 96·4°; pulse 90; respirations 18.

24th.—Much better; bowels freely moved yesterday; hyperæsthesia diminishing; numbness of lower extremities; urine very alkaline. Ordered dilute nitro-hydrochloric acid, chop and a pint of ale. There is a tendency to sloughing over the nates; spine firmly strapped, and placed on a water bed. Temperature, same as yesterday.

Dec. 4th.—Has continued steadily to improve; the hyperæsthesia has disappeared, with the exception of a little at the outer aspect of each leg. He has passed urine to day for the first time since the accident; has been sitting up in bed; complains only of what he calls a "galvanic" sensation in the legs. Bowels obstinate, requiring the administration of purgatives.

23rd.—Got up to-day, and was able to move about the ward with crutches and assistance; legs and feet very numb.

From this date he rapidly improved; the legs gradually regained their proper feeling, and his only complaint is a feeling of stiffness if he stoops to pick an object from the floor.

Jan. 1st.—Discharged cured, with only very slight thickening at the seat of injury.

J. McG—, porter, æt. 29, admitted Jan. 26th, suffering from fracture of spine with displacement. The injury was one from direct violence, having been caused by a bale of cotton falling on the man whilst in a stooping posture. On examination, it was found that the fourth, and a considerable portion of the fifth, dorsal vertebræ overlapped to the extent of an inch, the displacement being upwards and backwards of the lower fragment.

Very shortly after admission, chloroform was administered, and reduction easily effected exactly as in the last case, the only difference being that the reduction was accompanied by a coarse, crepitating jerk.

The treatment employed was the same as in the last case; the symptoms were the same, with this exception—this patient experienced intense pain, chiefly in the course of the nerves that had been stretched previous to reduction. To relieve this various remedies were applied with little benefit; it yielded, however, to the application of Corrigan's iron, applied at intervals along the course of the nerves.

On May 7th he was discharged, and shortly afterwards was able to resume his employment as a dock porter. The amount of thickening, after treatment, was considerably less than in the last case.

G. S—, a miner, whilst in a stooping position, was struck on the back by a large piece of falling rock. He was admitted into hospital, almost immediately after the accident, on Sept. 23rd.

On examination, it was found that the sixth dorsal vertebra was considerably displaced, and to the right side; the left leg had sustained a comminuted fracture of both bones just above the ankle; the right leg was paralysed, and priapism existed. The left leg and thigh were very remarkably sensible to touch, the least impression giving intense pain evidently quite unconnected with the fracture. He was seen immediately after admission, and the fractured leg having been previously put up, the reduction of the displaced spine was effected in the manner above described, but with considerable difficulty; the skin and muscles were so tightly stretched over the displaced bone that it required the knee of the operator and great force to get the bones in apposition.

He was put to bed; forty drops of Liq. Opii Sed. administered and the catheter passed.

24th.—Great pain at seat of fracture; abdomen very tympanitic; bladder distended; can slightly move the toes of right foot; no motion of leg. The anæsthesia of left leg about the same. Ordered a stimulating injection; catheter to be passed. Pulse 93; temperature, upper $99\frac{4}{5}$°, lower $98\frac{2}{5}$°.

26th.—Not so well; can move neither leg; urine ammoniacal;

motions are passed involuntarily; in an irritable and excited state. Ordered a saline febrifuge, and one of Holt's winged catheters to be introduced. Pulse 120; temperature, upper $100\frac{1}{5}$°, lower 99°.

29th.—Greatly improved. He can slightly flex the right leg, and the extreme sensibility of the left is rapidly diminishing. Urine is excessively ammoniacal; bowels relieved by daily injections. He is not aware when the bowels act, and can retain the fæces for some time.

Oct. 22nd.—Since last date has steadily continued to improve; sat up in bed to-day for first time, for two hours; has passed a little urine naturally; bowels still constipated, requiring frequent enemata; no pain in back, and parts feel firm; can move right leg fairly; left leg quite easy in gum and chalk. Pulse 72; temperature of upper and lower extremities $98\frac{3}{5}$°.

Oct. 28th.—Got up for first time; passed urine and fæces naturally; says he feels quite well.

Nov. 8th.—Discharged cured. A very slight nodule only over seat of fracture.

Dec. 30th.—Saw the man to-day; is in good health and walks with only a stick, has no trouble from back, but limps a little in consequence of the fracture of left leg.

EXOPHTHALMIC BRONCHOCELE.

By MATTHEW HILL, F.R.C.S., M.R.C.P.E., &c.

I HAVE selected this subject more from the rarity and interest of the disease than from the consciousness of any ability to further illustrate it or throw new light on the vexed questions involved in its pathology, and because I have met with two well-marked examples, which shall form my illustrations, as well as one or two "incomplete" cases, but of the latter more anon. The disease is marked by a triple combination of symptoms which renders its diagnosis a matter admitting of as little doubt as a club-foot or a squint. That this triple combination, viz. palpitation, swelling of the thyroid, and protrusion of the eyeballs, did not attract attention until the late Dr. Graves, of Dublin, in the year 1835, pointed it out as indicative of an individual and separate disease is truly a matter of wonder; but I suppose we all experience this sensation when any discovery or new invention is submitted to us. In the language of Milton,

> "Th' invention all admired, and each how he
> To be the inventor miss'd; so easy it seemed
> Once found."
>
> *Par. Lost*, B. vi, 479.

There appear scattered records (much earlier than the date above mentioned) of cases which, by their intrinsic evidence, seem to belong to the disease in question; but these have been recorded either as exophthalmos with peculiar symptoms, or of diseased heart accompanied with goitre. No one seemed struck with the entity or individuality of the disease, or the peculiar bearing of its features upon one another, or of the whole upon a disordered nervous system. In consequence of Dr. Graves first calling attention to it, Trousseau and others have named the disease "Maladie de Graves;" a German writer, Von Basedow, divides this honour with him, as Niemeyer and others have called the disorder "Morbus Basedowii;" it has also been termed "Anæmic Exophthalmos," and has been described under various other names.

But by whatever title recognised, the disease is marked by protrusion of the eyeballs (technically called exophthalmos) by swelling of the thyroid gland (termed goitre or bronchocele) and by rapid and excited action of the heart. These essential signs are generally accompanied by irritability of the digestive organs, spanæmia and defective brain power, in varying degrees. The subject of my first illustration is a lady, æt. about 30 years, of nervous temperament, yet not fidgety as such patients usually are, of spare habit, pallid complexion, and quiet demeanour. Her eyeballs are very much extruded, giving a strange, staring appearance to the eyes, from the sclerotic being more than usually exposed; the front and base of the neck are swollen to nearly one half more than the normal size, the lobes of the thyroid being tolerably well marked and communicating a thrill and pulsation to the fingers; the pulse when I first saw her ranged from 120 to 140 beats per minute on an average, but occasionally, when startled or excited, her pulse could scarcely be counted. When I ceased my attendance the average was 80 to 90 beats, by which it will be inferred that the disease was not completely cured at that time; she was, however, much better, and seemed disinclined to swallow more physic. I have seen her lately, her exophthalmos and goitre have almost if not quite, disappeared; the palpitation, however, troubles her occasionally. The heart sounds were normal except for a soft systolic bruit, and there was *bruit de diable* in the jugulars; there existed no swelling of the feet, but a disposition to dyspnœa when going upstairs, or on attempting to hurry. The digestive system was weak and capricious. The following graphic description of her case was written by herself at my request, and without any prompting of mine:

"My illness was, I believe, caused by the sudden death of my father, five years ago, which caused my heart to beat heavy and quick; what I mean by heavy is that it thumped against my side, and has continued to beat heavy and quick until this day, but with different degrees of heaviness and quickness. About a week after the first commencement (as I believe) of my illness, my eyes commenced to protrude and have a stare in them. I lost my appetite and grew gradually weaker; and as I grew weaker, I had severe pains at the top of my head accompanied with a burning heat in the head; when the pains left the head the heat also left. The pains in the head lasted for very irregular periods, sometimes for two and at others for twenty-four hours. About three months after my illness commenced I found my neck gradually swelling, and about three months later it was at its largest. By this time I had grown very thin and weak; my weakness consisted of weakness in the limbs, of shortness of breath when making the slightest exertion, and what I may describe as a sinking of the body. The weakness was so great, and the pains in the head so severe, at some periods, that I lost the power of fully explaining my thoughts in words. After continuing in this state for some three or four months I went to Cumberland and remained there four months, when I slowly regained my appetite, and as my appetite returned my strength increased a little. I have always great heat and pain in my head when I lose my appetite. I seldom ever feel cold. I have stiffness in the joints. At the present time I have better health than I have had at any period since the commencement of my illness; before this illness commenced I enjoyed good health and was stout."

The notes of the second case have been supplied me by my friend Mr. Young, under whose care the patient has been lately; it being about twelve months since I last prescribed for her.

"Mrs. L—, æt. 29, married eleven years, has never had any children. Has suffered a great deal of anxiety for some time back. Patient is a native of the south of Ireland, but has been reared in the Channel Islands. Nine years ago she came to live in Liverpool, a few months thereafter she had pleurisy on the left side, which was followed by a very low state of health for about twelve months. This condition improved somewhat, but the patient next became subject to fits of intolerable headache. During the last five years she has suffered more or less from palpitation. Two years and a half ago, she for the first time had her attention drawn to the condition of her throat, and six months later she noticed the prominence of her eyeballs.

"The menstrual flow had been slight, and she rarely went the month, but since that time it has been gradually diminishing. She has never suffered from dysmenorrhœa. The thyroid body increased very rapidly during the twelve months after she first noticed it, but during the last eighteen months it has been tolerably quiescent.

"About twelve months ago she suffered from some form of fever, which brought her very low, and in which she had intense headache and incessant vomiting. This was followed by ulcerated sore throat and an abscess in the meatus of the ear.

"Since the thyroid has enlarged, she has suffered from noises in the ears, so that she has to keep her hand under her head to keep it off the pillow.

"On examination we find enlargement of the whole gland, but more particularly of the right lobe, the middle being also enlarged. Pulsation of the whole mass quite visible to the eye. *Bruit de diable* sensible to the hand.

"The tumour measures 6 inches across, the right lobe being 3½ inches, and the left 2½ inches, the right lobe from above down 3$\frac{2}{8}$ inches. The patient is highly nervous. Heart very irritable, with soft murmur at the base; a considerable quantity of dropsical effusion about abdomen and lower extremities, a somewhat albuminous look about the face. Tongue flabby and white. Pulse weak, quick, and irregular. She suffers a good deal from dyspepsia and flatulence.

"*Examination of Urine.*—No albumen, no sugar, a small mucous chord.

"*Treatment.*—Pil. Galbani comp. gr. iij, Pil. Aloes c. Myrrhæ gr. ij, M. ft. pilula omni nocte sumend., with full doses of Tr. Ferri Perchlorid. and Tr. Digitalis, and Emp. Belladon. pro regione cordis. Stopped all tea, beer, potatoes, sugar, &c., ordered a more nutritious diet, and a little brandy and soda water. This had marked benefit on the heart and pulse. Patient improved in every way. Some days later ordered small doses of Potass. Iodid. with Tinct. Cinchonæ, and I intend, moreover, applying Potass. Iod. locally."

It is to be noted that in both the cases there was as a starting-point mental disturbance; in the one sudden grief, and in the second protracted anxiety; and I believe most others will furnish a similar history. Upon this mental depression, or nervous exhaustion, follows at various intervals palpitation of the heart, then the exophthalmos, and finally the goitre; this is the general sequence, but occasionally, as in the second case, the goitre seems to precede the exophthalmos.

As the patient recovers the cerebral irritation first disappears, next that of the heart, then the orbital swelling subsides, and eventually that of the thyroid; concurrently with this improvement the sleep returns, the appetite and digestion recover tone, the emaciated body its flesh, and the blood its proper proportion of red corpuscles.

It would seem that the thyroid body acts as a break to the force of the circulation, or rather to the volume of the blood which, in consequence of the generally dilated condition of the blood-vessels and the rapidity of the heart's action, is propelled in undue quantities towards the brain, as the labouring carotids and the loaded condition of the orbital vessels testify. It may be, also, that this state of the vessels of the orbit is wisely intended as a second diverticulum to the blood, thereby sparing the thin-walled vessels of the brain from the strains which the sudden emotions to which such patients are peculiarly liable would subject them.

As an illustration (more plausible than scientific, it must be confessed) we might look upon the vessels of the thyroid body, and perhaps those of the orbit also, as fulfilling the office which the interposed net-covered elastic ball serves in Richardson's spray-producing apparatus, namely, an equaliser and moderator of the force with which the air is to be propelled by the end ball or bellows towards the spray points: imagine the bellows of the apparatus the heart, the air the blood, the fine spray points the cerebral capillaries, the interposed elastic ball the thyroid body, and the analogy is complete, except that in the apparatus the diverticulum is placed on the direct channel, and in the disease upon a collateral or indirect channel.

A better analogy may be instanced in the *rete mirabile* on the carotids of the Ruminants, the effect of which is to moderate the flow of blood to the brain whilst grazing. Graves compares the action of the thyroid body to erectile tissue, and suggests that the *globus hystericus,* is not merely a nervous but an actual sensation. The bruit which accompanies the systolic sound of the heart, and which may be traced into the great vessels, is at first of spanæmic origin; later on, where the chambers of the heart have become dilated with long-continued rapid work and consequently the proportion between their capacity and the area of the valves is no longer that of health, the abnormal sounds are further indicative of organic mischief, and are the precursors of cyanosis, dropsy, dilatation of the veins, and general static congestion of the body.

The associated pathology of the thyroid and the orbit is such as might be expected from the functional disturbances. When much protracted, accordingly, we find permanent hypertrophy of the vessels and substance of the gland, and disorganization of the cornea, which the eyelids no longer suffice to cover; a result to which strain upon the ciliary nerves conduces by rendering the eye incapable of protecting itself. We do not, however, meet with such extensive mischief, except as the result of great neglect. If recognised and treated in time, the prognosis is generally favorable, more especially if the symptoms have supervened quickly upon one another, the same rule applying to this as to many other diseases, namely, that the more chronic and less pronounced they are, the greater the difficulty in eradicating them from the system.

The treatment which is theoretically indicated is that which I have found practically most useful. It is in the first place to allay nervous irritability by opium, hyoscyamus, chloral, or other suitable sedative to the extent of procuring a fair amount of sleep—" Chief nourisher in life's feast." Until this be done it is useless to attempt to settle the stomach, which is often disposed to reject food, as much, I believe, by reason of influences transmitted from the brain as from debility of the organ itself.

In the next step some such mixture as the following will be indicated:

℞ Ammon. Carbon., ʒij.
Tinct. Cinchonæ, ℥ss.
Liq. Bismuthi, ℥j.
Syr. Papav. Alb., ℥j.
Aquæ, ad ℥viij.
M. ℥j c. ℥ss Suc. Limettæ 3tiis vel 4tis horis.
Mitte Succi Limettæ, ℥iv.

It may be remarked here parenthetically that with effervescing mixtures I generally order *lime juice,* and this for several reasons: it is as good, if not better adapted for the purpose, as either natural or artificial lemon juice; Sturge's Montserrat Lime Juice is to be found ready for immediate use in most chemists', and in many grocers', establishments, thus doing away with the trouble of buying and squeezing lemons, while it is also pretty uniform in strength. If the stomach be very qualmish three or four minims per dose of hyoscyamic acid may be added to the *juice.* The food should be light, nourishing and not stimulating, given in small quantities at a time, with ice if need be; milk and lime water, if the milk be not well borne by itself; the meat extracts and the farinaceous compounds are indicated.

These, together with quietness of mind and body, will generally bring the patient a considerable step on the road to recovery. We may now begin to use more specific treatment, by which I mean iron and digitalis. I say *now,* for it is worse than useless *beginning* the treatment with them; it is too great a measure of "reform" to be palatable to the stomach at first. But when, by the means previously indicated, the digestive organs have been "educated" up to a certain point, then this specific treatment will no longer be rejected, but will be borne more or less well in the earlier doses, and finally be productive of the benefits desired. I have found such a formula as the following amongst the most useful:

℞ Tinct. Digitalis,
Tinct. Ferri Perchlorid.,
Sp. Eth. Sulph.,
Syr. Zingiberis, āā ℥ss.
M. ʒj ter in die, ex aqua capiend.

Under the most favorable circumstances the disease is not likely to yield for many weeks, and the probability is that many months of patient and persevering treatment will be required; too often the patient gets tired of the doctor, or the doctor of the patient, before a complete cure can be effected. While upon the subject of treatment, I may remark that I do not think any external application (such as iodine) to the thyroid is of any service; a light bandage over the eyes may be worn at night, and if the protrusion be extreme, and the cornea suffering from exposure, an operation on the eyelids may enable them to cover the globe more effectually. The application of a belladonna plaster over the region of the heart may be of moral if not of actual service in the juvantia. Dr. M. Meyer, of Berlin, has recently published four cases in which brilliant results were obtained by galvanising the cervical sympathetic during a considerable time (during twenty, seventy-two, sixty, and eighty-four sittings respectively). He says the influence was also great upon the general health and upon the menstrual derangements. I have not tried this remedy and can, therefore, express no opinion regarding it. Trousseau recommends hydropathy in some cases, and I should expect it to be useful in removing the local congestions and engorgements (as of the liver, spleen, &c.) which are apt to occur in this disease. Hydropathy is besides an efficient means of equalising the circulation, or of determining it towards the skin, uterus, &c., according as it is skilfully applied.

I now come to a very interesting portion of the subject, namely, its etiology.

The origin of the disease has been variously referred to a cardiac, anæmic, and neurotic origin. Some of the Dublin physicians, (Stokes, Marsh, &c.) amongst the earliest observers, blame the heart. Begbie is one of the most eloquent advocates of the anæmia theory; but the latest opinions favour the idea of a neurosis (Niemeyer, Trousseau, &c.). To say that the disease is one of the neuroses is no more definite than to say that measles belong to the exanthemata; yet from our imperfect knowledge of nervous action, and more especially of the reciprocity of the cerebro-spinal and sympathetic systems, I doubt whether it is allowable to make a more exact statement at present. Nevertheless, there are some well-ascertained physiological facts which seem to have a bearing on the subject.

For instance, we know that the action of the heart is mainly due to its own sympathetic ganglia, controlled by a nervous stream from the cerebro-spinal system, mainly through the pneumogastric nerves. It is true that these pneumogastrics by the time they reach the chest are largely blended with fibres from the cervical ganglia, but in the main they may be taken to transmit cerebro-spinal influence. We know that division of the pneumogastric permits the action of the heart to be *increased*, presumably from the then uncontrolled influence of the sympathetic; also that irritation of the pneumogastric *retards* the action of the heart; presumably this irritation causes a temporarily increased flow of *vis nervosa* from the brain, whereby for a time the influence of the sympathetic is overpowered.

It seems to me, then, a fair deduction to say that in this disease either the action of the pneumogastric (which, as we have seen, is of a controlling and retarding nature) is in a depressed condition, or that the sympathetic is in a condition of increased activity. Observant of the general asthenic character of the disease, I am not disposed to accept the latter hypothesis, which involves the generation of increased force in the sympathetic system; I am rather disposed to think that the ganglionic force being the same is no longer controlled—is allowed to run riot, as it were, by reason of the depressed action of the pneumogastrics transmitting but feeble influences from the impoverished brain. The history of mental anxiety, grief or worry, which we generally receive from subjects of this disease, and the results of the tonic treatment I have mentioned, would seem to confirm my views. As to the apparently contradictory results, theoretically considered, of Dr. Weber's treatment, viz. galvanising the cervical sympathetic, I am not sure that a closer knowledge of his method would not establish the fact that the application of the current to various regions of the neck stimulated the pneumogastrics more effectually than the sympathetic. Or it may be supposed that the galvanic current supplied to the ganglia a controlling force analogous to, if not identical with, the ordinary nervous current transmitted by in this respect to what obtains in the heart, thyroid, and orbit.

It is almost needless to say the disease is most common in females, and that the right lobe of the thyroid is generally the largest, probably because it is naturally slightly larger than the left.

The cause of the disease attacking females most frequently may be set down to the greater excitability and tendency to derangement of their nervous system; the thyroid, too, has been known to reciprocate in some degree with menstrual irregularities.

NOTES ON TEMPERATURE IN SURGICAL CASES.

By W. MACFIE CAMPBELL, M.D., Liverpool.

In his introductory address delivered at the St. George's Hospital, Session 1868-69, Professor Acland, of Oxford, said he was glad that medical science was becoming every day more mathematical, and looked forward to the day when medical facts would be expressed with arithmetical simplicity.

I only hope the following generalisations, prepared from notes of cases, may not be considered too arithmetical.

The Correlation of Temperature, Pulse, and Respiration.

In surgery as in physic, with a high temperature, we have, as a rule, a correspondingly rapid pulse and respiration. When studying this correlation it is needful to attend to the following simple rules.

1. Take the pulse and respirations before taking the temperature, and before dressing or otherwise disturbing the patient.
2. Count the respirations more than once during an entire minute.
3. Divert the patient's attention from the respiratory function, and;
4. If excited, do not record the pulse, but wait.

The two last are most important. I have the notes of one case in which with temperature 102°, if spoken sharply to, the pulse rose to 140 or 150, the respiration to 70 in the minute. The following table, prepared by the analysis of a large number of cases from my own notes and from various journals, shows the average of the pulse and breathing, their extremes at each temperature, and the proportion between one and the other.

Temperature.		Pulse.			Respirations.			Proportion.
Fahr.		Mean.	Highest.	Lowest.	Mean.	Highest.	Lowest.	Pulse-resp.
97°	corresponds to	84	116	52	14	14	...	Nearly 6 —1
98°	„	88	136	56	19	24	14	4⅝—1
99°	„	92	128	64	22	40	15	4¼—1
100°	„	96	144	64	25	38	16	3¾—1
101°	„	103	140	72	27	32	14	3¾—1
102°	„	106	150	72	28	40	20	3¾—1
103°	„	115	148	80	27	40	20	4¼—1
104°	„	119	160	72	28	32	22	4¼—1
105°	„	130	144	80	31	44	28	4⅙—1

There is sufficient here to show how ridiculous any hard and fast rules would be; at the same time with each increase in one we have a closely corresponding increase in the others, and up to and under temperature 102° (the safety limit of Prior), the increase occurs with almost mathematical precision. Temperatures of over 105° are very fatal and seldom last long, the only exception being in erysipelas, in which a temperature of 106°—107° is not uncommon, often without a correspondingly high pulse.

In health the proportion borne between pulse and respiration is stated generally at 4 to 1 in the adult; this proportion, as will be seen, is not materially influenced by disease, except, contrary to what one would suppose, in low temperatures.

Rare instances of complete correspondence between temperature and pulse occur. I have recorded such a case ('Lancet,' Sept., 1873) in which the slightest variation in the one was synchronous with a like variation in the other. In this case the temperature 99°, corresponded to pulse 70, each degree Fahr. to 10 pulse beats, and further each tenth of a degree to one pulse beat, till the highest point, temperature 106°, pulse 140, was reached. A single day's observation from this interesting case (one of chronic pyæmia after amputation) will illustrate my meaning.

March 6th.—M., temperature 102·2°; pulse 102. V. temperature 105·2; pulse 132.

Effects of Drugs on Temperature and Pulse.

I have noted the effects of the five following drugs, with results in no way differing from those described by others.

Aconite (Tinct.) . .	1st case,	caused fall	in temperature	2·8°,	in pulse	40.*
Do. in ♏ij doses .	2nd case	„	„	1°	„	12.
Digitalis (Tinct. ♏v)	„	„	„	1°	„	16.
Quinine	1st case	„	„	1°	„	12.†
Do.	2nd case	„	„	·2°	„	2.
Do.	3rd case	„	„	1°	„	...

Bromide of potassium seemed to have a very slightly depressing effect.

Carb. of ammonia, with chloric ether, caused a rise of temperature 1·6°, pulse 20.

The Temperature in Typical Operation Cases.

The following rules may be given:

In Recovered Cases.—1. The temperature does not fall below normal, nor rise much above 103° (mean extreme 102·5°).

2. The highest temperature occurs on the second or third day.

3. Almost uniformly, temperature rises morning to evening, and falls evening to morning.

4. One observation seldom differs more than two degrees from that preceding or following it.

5. Temp. descends to normal during the third week (or in favorable cases earlier) except in chronic cases.

The following may be taken as a typical thermal case.

Case I.—Alfred L—, æt. 13. Lacerated right arm. Amputation below shoulder, Oct. 14th, 1871. Cured.

Date.	Temperature. Fahr.		Date.	Temperature. Fahr.	
Oct. 14 (amputation)	102·4°		Oct. 19	M. 100·6°.	V. 100°
„ 15	M. 102·4°.	V. 102·8°	„ 20	M. 100·8°.	V. 100·2°
„ 16	M. 102·2°.	V. 102·8°	„ 21	M. 99°.	V. 101°
„ 17	M. 100·8°.	V. 100·2°	„ 22	M. 100°.	
„ 18	M. 100·7°.	V. 100·4°	„ 23	M. 99·4°.	V. 98·4°

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* See paper by Dr. Buzzard, 'Practitioner,' vol. ii, p. 127.

† See Report of Drs. Murchison, Symes Thompson, and H. Weber to the Clinical Society.

In Fatal Cases.—1. The temperature may reach any point between 97° and 106° or even higher (mean extreme 104·7°).

2. Though the temperature is high on the third and fourth days, it is exceeded by the death temperature.

3. The rhythm of rise morning to evening, and fall evening to morning, is frequently broken.

4. The increments of rise or fall are very great, a difference of five degrees being not uncommon between one observation and another.

5. The temperature rises in the third week towards death.

The following is fairly typical, excepting rule 4.

Case II.—William H—, æt. 45. Injury to arm. Amputation above elbow, Oct. 13th, 1870. Died, Oct. 28th, 6 p.m.

Date.	Temperature. Fahr.		Date.	Temperature. Fahr.	
Oct. 13 (amput.)	M. 100°.	V. 101°	Oct. 21	M. 100°.	V. 100·6°
„ 14	M. 101·4°.	V. 102·4°	„ „ Rigor.		
„ 15	M. 103·3°.	V. 102·5°	„ 22	M. 101·7°.	V. 100·7°
„ 16	M. 103·2°.	V. 102·7°	„ 23	M. 101°.	V. 100·5°
„ „ Secondary hæmorrhage.			„ 24	M. 101°.	V. 103°
„ 17	M. 101·7°		„ „ Rigor.		
„ 18	M. 103°.	V. 101°	„ 25	M. 102·5°.	V. 101°
„ „ Rigor.			„ „ Rigor.		
„ 19	M. 100·2°.	V. 102·3°	„ 26	M. 102·6°	
„ „ Again hæmorrhage.			„ 27	M. 103·8°.	V. 104°
„ 20	M. 101·3°.	V. 101°	„ 28	M. 105°.	V. 105·6°

Exceptions.—1. Death may take place at the end of the first week with a high temperature; as for example:

Case III.—J. H—, æt. 30. Compound fractured leg, Feb. 22nd, 1871. Amputation March 31st. Death April 7th.

Date.	Temperature. Fahr.		Date.	Temperature. Fahr.	
March 31 (amput.)	M. 105·8°.	V. 103·8°	April 4	M. 103°.	V. 103·4°
April 1	M. 105°.	V. 103·8°	„ 5	M. 105°.	V. 101°
„ 2	M. 102·6°.	V. 103·4°	„ 6	M. 102·6°.	V. 105°
„ 3	M. 103·4°.	V. 103·4°	„ 7	M. 105·4°	

2. Death may take place at the end of the first week with a low temperature; as for example:

Case IV.—A. C—, æt. 19. Lacerated foot. Amputation Nov. 22nd, 1870. Died Nov. 30th.

Date.	Temperature. Fahr.		Date.	Temperature. Fahr.	
Nov. 23	M. 101·2°.	V. 101°	Nov. 27	M. 100·2°.	V. 100·3°
„ 24	M. 102°.	V. 98·4°	„ 28	M. 99·6°.	V. 98°
„ 25	M. 102·8°.	V. 102°	„ 29	M. 98·2°.	V. 97·5°
„ 26	M. 101·3°.	V. 101°			

These exceptions owe their difference, in the first to the length of stay in hospital (five weeks) before operation, in the second, a primary amputation, to constitutional causes. Death in the first was from pyæmia, in the second from tetanus.

Safety Limits of Temperature.

In a paper in the 'British Medical Journal' (1868, vol. i, p. 451) Dr. C. E. Prior gives the temperature of 102° as the "safety limit" in general. To test this observation I have compared all the cases I have with the result of a striking corroboration of Dr. Prior's views; from the analysis of my cases the general safety limit seems to be 102·7°; the difference being probably due to the small number of cases I have.

Subjoined is a table to show the mean extremes in fatal and recovered cases. With one slight exception fatal cases show both higher and lower temperatures than recovered.

Nature of case.	Cured.			Died.		
	No. of cases.	Mean highest.	Mean lowest.	No. of cases.	Mean highest.	Mean lowest.
Fractured skull	4	102·8°	98·2°	5	104·1°	97·9°
Operations	14	102·5°	98°	10	104·7°	97·3°
Compound fractures	4	102·2°	98·5°	5	105·3°	98·2°
Simple fractures	2	100·4°	98·3°	...	...	...
Erysipelas	3	105·7°	97°	...	...	...
Pyæmia	...	...	...	5	104·9°	97·3°
Mean	27	102·7°	98°	25	104·7°	97·5°

Erysipelas upsets all rules; the excessively high temperature so often found does not seem to mark the same danger to life as in other diseases.

In surgical disease the temperature is most frequently found between 99° and 100°; then between 100° and 101°; then 101° and 102°; next 102° and 103°; then 98° and 99°; next 104° and 105°. Temperatures above 106° and below 97° are about equally infrequent.

Temperature of 99°—100° contains ¼ of all observations.

Temperature of 99°—101° contains ⅓ of all observations.

BRIEF PRACTICAL REMARKS ON INJURIES TO THE HEAD.

By HENRY LOWNDES, L.K.Q.C.P.I.,
SURGEON TO THE LIVERPOOL NORTHERN HOSPITAL.

I PROPOSE to make a few remarks on the phenomena that occur in certain injuries to the head. A long experience at the Northern Hospital has impressed various points upon me, and to these I shall briefly draw attention. My remarks may possibly be useful to those who have occasionally to treat such cases, but who may not see them sufficiently often to enable them to trust to their own experience, though I fear I have nothing very new to propose, and nothing to say that has not been said better, but perhaps less concisely, by others.

Fractured base.—Effusion of blood immediately underneath the conjunctiva of the eyelid of one or both eyes has been of late considered pathognomonic of fracture extending into the base, but I had recently under my care a young man who had this symptom very well marked, and who had also lost blood from one ear, yet there could have been no fracture, for in two or three days he was perfectly well. I have, however, often seen this symptom where the fracture undoubtedly did exist, and it ought, no doubt, to have its place among other important symptoms.

If we cannot always judge with certainty on the patient's admission as to the base being fractured or not, we are put out of doubt in a very few days if the patient revive from the first collapse. If there be a fracture, when reaction comes on sharp febrile symptoms set in, heat and pain in the head, delirium aggravated at night and often most violent, the patient screaming and howling all night. This often passes into a typhoid condition, muttering delirium, sordes, perhaps paralysis, and either death or a slow and protracted and rarely perfect recovery.

If the progress of the case be not somewhat like this, though perhaps less grave, I should strongly doubt the existence of fractured base.

Recovery from fractured base.—I do not remember ever having seen, among my own patients, more than one case of perfect recovery from well-marked fracture of this kind, and in that case a copious discharge of limpid fluid from one ear left little doubt of the nature of the injury. His illness was long and alarming, his recovery complete.

I have, however, seen several cases in which life remained, but life more or less damaged. In some cases paralysis of one side of the face is left, and does not seem amenable to treatment. In others the mind is left damaged, and the patient remains half-witted, cunning, and mischievous and intractable, or fatuous, unclean in his habits, and with imperfect control of the sphincters.

Treatment in fractured base.—When the stage of concussion begins to pass away we may hope to lessen the coming reaction by calomel purgatives. When insomnia and high delirium come on ice must be freely applied to the shaven scalp, and in a day or two free blistering often proves most useful. The whole scalp may be blistered one day, and on the next the nape of the neck and the spaces behind the ears, and as the parts heal the process may be repeated over and over again. I have seen the most marked effect thus produced both in allaying maniacal excitement and in rousing from stupor. The bowels are now most difficult to move, and calomel in large doses, croton oil, or colocynth enemata must be administered. The relief they give is often marked. Meantime milk, beef tea, and ice must be given freely, and if necessary nutrient enemata. I usually abstain entirely from giving stimulants in head cases until the inflammatory stage has passed away, but, of course, if signs of sinking appear a little brandy must be given.

By treatment of this kind I believe life is not unfrequently saved in fractures of the base, but the course of the illness is always long, the state of the patient always alarming, his condition on discharge almost always unsatisfactory.

Fracture of vault of skull without scalp wound very exceptional. —A central depression of the scalp with a raised hard surrounding circle of tissue often gives to the finger a feeling of a depressed fracture of the skull, which is well known to be deceptive. As the effused blood or lymph is absorbed the swelling and the depression alike disappear. As a rule, where we see no injury to the scalp we need not fear any fracture unless of the base, and still less any depressed fracture, but I have seen the following remarkable exception:—A young man *walked* into the hospital and said that he had been struck violently by a plank; the skin of the forehead was just grazed. He was put to bed, and had not been long there before he was seized with convulsions. I at once made a free incision on the left brow, and exposed a most extensive irregular ragged fracture extending evidently down through the orbit to the base, and in two separate places depressed and driven quite through the lacerated dura mater. The depressed portions were removed with temporary relief, but the patient died in a day or two.

Depressed fracture.—In depressed fracture in civil practice we generally find the depressed bone is a piece of limited size. As far as the outer table is concerned we may perhaps find a mere slight hollow, a fissure, or else one edge of the fracture a little lower than the other, while one or both of the edges of the inner table may be extensively shattered and depressed. The dura mater is often bruised, and sometimes lacerated. We can often be guided, when the examination of the wound leaves room for doubt, by the nature of the accident. Depressed fractures are generally caused by a sharp blow with some not very heavy substance, such as a half brick or stone, a jug or tumbler, or by a fall upon some pointed substance; a sharp kick from a horse is a not unfrequent cause. If we find there has been very great violence used, such as in a fall down a ship's hold, or from a house top, or in some very heavy substance falling upon the head, we shall generally have fracture of the base. In these latter cases if we feel a depression of the exposed bone we have only to enlarge the external wound in the course of the fracture to find how hopelessly extensive the fracture is. In a case from which was taken the most beautiful specimen I ever saw of greatly depressed starred fracture of the inner table, with a mere dimple of the outer table, the injury had been inflicted by a blow from the bottom of a tumbler that had been hurled at the patient by another woman. The patient was only admitted several days after the accident, when abscess of the brain had formed which found its way into one of the lateral ventricles and proved fatal.

Treatment of depressed fracture.—In military practice it is now, I believe, the rule not to interfere with depressed fracture. Now, of course, in warfare these fractures must generally be gunshot wounds, the bones will probably be shattered, and any pieces that are driven into the brain will not be firmly impacted among and locked in by the surrounding bone, as in the cases we generally see in civil hospitals, but may readily come away or be removed as the processes of suppuration and granulation go on. Hence, I presume, the success of this practice. The same practice, I am afraid, is far too common among our civilian brethren, but I am strongly of opinion that, in cases such as I have been describing in civil practice, to leave a piece of bone pressing on the dura mater and so on the brain, and perhaps even entering the substance of the brain, is to condemn the patient either to speedy death or to a very precarious life. If abscess do not take place, epilepsy may come on even years after, or the patient may become maniacal on the first excess. We know also how futile operative proceedings generally are in these cases if delayed until symptoms of abscess occur.

I believe it is proper always to try to elevate or remove the depressed portion whenever there is a wound leading to the bone and decided depression can be felt, and we have no reason to suspect that the fracture extends to the base.

Operation.—In nine cases out of ten this removal or elevation can be effected by means of large, strong, sharp bone forceps curved in the blades, so that the point of the lower blade can be got well under the edge of the sound bone. A small triangular piece must be cut out and then the lever can be inserted under the depressed bone and the sound bone used as a fulcrum. Sometimes, as when the skull is very thick, this is a tedious and difficult process. It is when the injury to the outer plate is not great and we believe the inner plate to be seriously depressed that we have to apply the trephine.

As to the question of removing or merely elevating the depressed portion the old rule holds good of never removing more of the skull than is necessary, but it is always well to remove enough bone to allow a finger to be passed in, that we may examine the state of the dura mater, and also satisfy ourselves that there are no sharp corners or fragments of bone left that may irritate that membrane.

On incising the dura mater.—If the dura mater be much bruised or scraped, or at all wounded, I believe it to be good practice to incise it freely the whole extent of the opening in the bone, which I have done in more than one instance. When the dura mater is at all injured, and inflammation follows, this tough membrane, like the fascia lata on the outside of the thigh, is very apt to slough, as unable to bear the least tension, and free incisions at first will prevent this, and will also give vent to any matter that may form under the dura mater. I have seen no harm follow this practice, and in one case I felt satisfied that an abscess did find vent through an opening thus provided.

Wound of dura mater or brain.—A laceration of the dura mater or of the brain-substance itself no doubt must add somewhat to the gravity of these cases of depression, but I do not think very seriously so, provided a sufficiently large opening be left in the bone to give free vent to discharges, and all irritating spicula of bone be carefully removed.

Treatment after the operation.—Water dressing to the wound, and after a day or two a light poultice, unless the antiseptic treatment be preferred. Light nourishment, with complete abstinence from stimulants as a rule. Perfect quiet. If any sharp inflammatory symptoms come on, ice to the head, calomel in large doses, blister to nape of neck, &c.

Case of depressed fracture.—I published in the 'British Medical Journal' of July 7th, 1866, seven cases of fracture with depression, in one of which trephining was performed and in the rest the bone forceps was used. Since that time I have met with very few cases suitable for operation, but I may refer to one very interesting case in which curiously enough the immediate cause of the depression was also the cause of life being preserved. I have mentioned a fall into a ship's hold as one of the most common causes at this hospital of fractured base, but in the case I am about to mention an iron bolt projecting a short distance from the kelson acted exactly as a buffer, drove a circular piece of bone down upon the brain, but broke the shock which must otherwise have been fatal.

Catherine H—, æt. 48, a very stout, square-built person, wife of a tradesman in this town, was admitted into the Northern Hospital on July 18th, 1867, suffering from a compound depressed fracture of the skull, caused by her having fallen into the hold of the Cunard Steamer Australasian, one of our largest Atlantic steamers. Her head had struck upon a sharp projecting bolt or rivet head, and it was found that a circular piece of bone of about an inch diameter had been as it were punched out of the skull, which was unusually thick, and driven in upon the dura mater. With some difficulty I removed this piece by cutting out a small portion of the circumference of the hole in the bone and so getting a lever under the piece that had been driven in. She was quite insensible all the time. The dura mater was very little injured.

She remained for some days in a very critical condition, and the state of concussion did not pass off until the sixth day, when she became sensible. She still remained very heavy and stupid until the twelfth day, when considerable hæmorrhage took place in the night. It was readily arrested and did not recur. The loss of blood relieved her head in a marked manner, and she now rapidly improved and was discharged nearly well on August 30th. I have seen her several times since and she has remained well and able to attend to business, but with rather an apoplectic look and a tendency to giddiness if she looks upward or turns her head quickly.

Insanity following concussion.—I have met with two cases in which profound and long-continued concussion was followed by a state of mania. There was in both cases a short interval between the passing away of the stupor and the commencement of the mania. In both cases the insanity was of a mild and harmless character, free from homicidal or suicidal tendency. The patients have delusions; they think they are among their horses or at their work and talk away accordingly. They take their food well and their general health is good. I have not had opportunities of watching these cases long enough to say what the prognosis is, but I should think as reparative changes take place in the brain we might expect a gradual improvement. The insanity forms a marked contrast to that dementia I have alluded to as sometimes following fracture of the base.

In concluding these few remarks I may be allowed to acknowledge the indebtedness every hospital surgeon must feel to Mr. Prescott Hewitt's admirable article on "Injuries to the Head," in 'Holmes's Surgery.'

CANCER IN THE INFANT.

By Dr. OXLEY,
PHYSICIAN TO THE LIVERPOOL INFIRMARY FOR CHILDREN.

The following instances of cancer in the *infant* have come under my notice at the Children's Hospital, and although cases of this disease have been recorded from time to time, yet they are of sufficiently rare occurrence to make the relation of any additional cases interesting. That they are rare is I think proved by the fact that, during the time I have been connected with the infirmary, now nearly eleven years, 44,000 patients have presented themselves, and out of this number only four cases have been observed; one of these came under the observation of my friend Dr. Rawdon (cancer of the testicle) and was afterwards lost sight of; the other three were seen by myself and will be detailed in this paper. I have looked over the whole of the published 'Transactions' of the Pathological Society, and have been able to find therein only two cases of cancer occurring during *infancy*.

Case 1.—Alfred G—, æt. 5 months, admitted January 18th, 1870. Plump, healthy-looking child, has one sister, older than himself, in perfect health; mother also very robust and healthy in appearance.

Mother states that five weeks ago she noticed a swelling in his belly, commencing below the ribs on the right side, which gradually increased to the present time; the child never seemed to suffer any pain, but has several times been jaundiced. On examination a large tumour was observed extending from beneath the ribs onthe right side to the level of the crest of the ilium, and inwardly across the abdomen. Considerable pressure did not cause pain. The tumour felt hard and was dull on percussion. Distinct fluctuation was felt midway between the umbilicus and lower end of sternum; here also the tumour was most prominent. There was no discoloration of the skin; fæces have varied in colour; urine secreted in normal quantity and quality. The child remained under observation for two months when he was attacked by violent vomiting and purging, the tumour meanwhile increasing rapidly. March 26th, the child died in convulsions.

Post-mortem twelve hours after death.—The abdomen was opened and a tumour of the right kidney was removed weighing 25 oz. The spleen was covered with recent lymph, and the cavity of the peritoneum contained a small quantity of grumous fluid. The left kidney was healthy, but about double the usual size. The tumour consisted of the right kidney infiltrated with encephaloid cancer: the fluctuating portion proved to be a large cyst; the ureter was pervious, but little of the kidney structure remained. Dr. Braidwood in his paper on "Cancerous Disease of the Kidney" * refers to this case, and gives a drawing of its microscopical appearances.

CASE 2.—Mary W—, aged 5 months, admitted February 25th, 1873. Fairly nourished child with muddy complexion, mother and father healthy.

Mother states that when the child was three months old, a lump appeared in front of abdomen just below the sternum; soon it moved to the left side over the ribs in front. I found on examination a fluctuating swelling above the umbilicus, which could be emptied on pressure, the contents finding their way up to the situation of the swelling on its first appearance. There being some doubt about the character of the tumour, the child was placed under chloroform, and the tumour was found to be connected with the liver. The fluctuating portion was punctured with the aid of the aspirator, but only a small quantity of bloody fluid was obtained: this on examination under the microscope was found to contain cells such as are usually met with in cancerous growths.

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* 'Liverpool Medical and Surgical Reports,' vol. iv.

The edge of the right lobe of the liver could be plainly felt; on the left lobe the cancerous growth was very easily made out. The tumour increased rapidly; the child became emaciated; latterly general œdema was present, and on April 8th death took place from exhaustion.

Post-mortem twenty-four hours after death.—On opening the abdomen I found a large quantity of bloody serum and a cancerous mass springing from the left lobe of the liver; the gall-bladder was also the seat of this disease, the liver and cancerous mass weighed together 36½ oz. The cancer was of the encephaloid variety, was nodulated on its surface and very vascular. The right lobe of the liver was pale and had evidently been subjected to great pressure, being folded into rugæ. A section of the tumour gave much the same microscopical appearances as the fluid obtained with the aspirator.

CASE 3.—In this case, as I have unfortunately mislaid my notes, I must quote from memory.

The child was at the breast, and was brought to the infirmary on account of what looked exactly like a "black eye." I at first thought that the ecchymosis had been caused by a blow; but on closely questioning the mother I learnt that it had come on three or four days before, getting deeper in colour each day. I kept the child under observation for some weeks, during which time the eye began to protrude, the iris was widely dilated, the globe filled with malignant deposit, the face and temple became swollen, and a mass of cancer burst through the orbit. The child died of exhaustion. No *post-mortem* was allowed.

Case 1, when presented at the hospital was very readily made out to be cancerous; but whether of the liver or kidney it was difficult to say, as the tumour extended upwards and was continuous with the liver.

In the second case the difficulty was greater. The history of a swelling on the ribs made one suspect abscess; this was strengthened by the fact, which the examination after death failed to explain, that on pressure the tumour at the umbilicus could be completely emptied: it was with a view to explore for pus that the child was placed under chloroform. This latter proceeding in the case of children should always be adopted, as it is impossible to thoroughly examine the belly of a crying child without its assistance. When under chloroform all the viscera can be thoroughly examined.

The third case is another example of the great difficulty in distinguishing this disease in its first stage. The only plan is to wait before giving an opinion, as a short time will suffice to clear up the difficulty.

One case which has come under my notice, in which the liver, kidney, and more especially the spleen, were very greatly enlarged, is worth mentioning in order to show the differences which exist between simple enlargement and cancerous degeneration of these organs. The child was brought to me suffering from emaciation and a large tumour of slow growth under the ribs on the left side. This on examination was found to measure six inches by four and a half inches; it was smooth on its surface, free from tenderness, with a sharp and well-defined edge and was in the situation of and shaped like the spleen. In this case there was no difficulty in forming a diagnosis either by Dr. Gorst, whose case it was, or by myself, and we confirmed our opinion at the *post-mortem* examination.

When therefore we find an abdominal tumour in an infant, in the region of the kidney or liver, irregular in its outline, fluctuating at a point or points, increasing with great rapidity and giving little inconvenience except by reason of its volume, we may safely say that it is cancerous degeneration of one or other of these organs. In order to ascertain which it is, the child ought always to be placed under chloroform and a careful manual examination made.

With regard to the relative frequency of this disease in the liver and kidney, I have reason to believe that the latter is the organ most usually attacked. The treatment of course is only palliative: in cancer affecting the testicle and cancer of the hand it is on record by Bryant and Holmes that removal cures the disease. In the encephaloid cancer of infants the glands seem never to be affected.

ON THE DEFINITION OF TUBERCLE.

By JAMES ROSS, M.D., Waterfoot, near Manchester.

The following attempt to define tubercle was made for my own personal satisfaction after reading the memorable debate at the Pathological Society, "On the Anatomical Relations of Pulmonary Phthisis to Tubercle of the Lung." No one will deny that the addresses delivered upon that occasion were characterised by great ability, but after a careful perusal of them, there was left in my mind a sense of vagueness almost amounting to confusion. I should have thought that the fault lay entirely with myself, had I not found that most medical men with whom I came in contact at the time gave expression to the same sense of bewilderment amongst the mass of details, and the apparent contradictions between the different views entertained. A careful study of that debate convinced me that the differences of opinion arose, not so much respecting the facts,—not even entirely regarding the interpretation of facts,—but in great measure from want of a mutual recognition of the exact meaning of the terms employed. I am not so presumptuous as to think that the following definition will be generally accepted, nor is it advanced as containing new views regarding the nature of tubercle; but a careful attempt to define the term, however unimportant it may be in itself, will be attended with considerable advantage, and may help to evoke more order in our mode of conceiving the subject. Even on the supposition that the definition is objected to in its entirety—in this instance a large portion of it is borrowed from such good sources that this is not likely to happen—I should still be entitled to ask my opponent upon what principle the objection is made; and if he succeed in enunciating an intelligible principle for our guidance in framing the definitions of pathological morphology, it will be a clear gain to the science. If, on the other hand, some of the elements of the definition only are objected to, these may be modified, or omitted and replaced by others, so as to bring the definition finally into conformity with the highest knowledge we possess of tubercle, and a definition, however perfect it may be, can never be in advance of our knowledge of its subject-matter.

What, then, is tubercle? Is it a growth? Even upon this simple point there is by no means unanimity of opinion. But the difference of opinion in this instance manifestly arises from want of agreement regarding the definition of the term "growth" as employed in pathology. Some appear to think that in pathology *growth* is only applicable to cancer, sarcoma and to tumours generally; and, if this be the accepted meaning of the term, to call tubercle a *growth* is to affirm that it has greater affinities with tumours than with inflammatory products. It is very apparent, however, that those who maintain that tubercle is a *growth* give to the latter term a much more extensive meaning; but, since I do not know the exact sense in which it is used by others, I must proceed to define it for myself.

Anything is said to grow when it increases in size, and whatever grows by the addition of new material may etymologically be called a growth. In this sense, therefore, there is a pathological growth whenever a diseased part or a diseased product increases in size by the accumulation of new material. This definition, however, is not sufficiently precise. Passing over the term abnormal and its correlative normal as sufficiently definite for our purpose, the definition does not exclude inorganic concretions within the body, and great confusion would arise were these admitted into the list of pathological growths. Inorganic concretions may, however, be excluded by saying that a pathological growth is an abnormal increase of the size of a part of the body through the accumulation of *organic* material. But in tubercle, though there is an accumulation of organic material at certain localities, there is often little or no increase of bulk. If, therefore, tubercle is to be called a growth we must leave the increase of bulk out of the definition, and consider any abnormal accumulation of organic material in a certain locality a growth whether it be or be not accompanied by augmentation of bulk. This amendment rescues us from one difficulty only to land us in others. When the stomach is overloaded by food there is an abnormal accumulation of organic materials, but no one would be inclined to call this a growth. In hæmorrhagic effusions such as pulmonary apoplexy there is an accumulation of organic material at a certain locality, but this also is not a growth in the general acceptation of the term. But if we say that a pathological growth is an abnormal *assimilative* accumulation of organic materials at a certain locality of the body this difficulty will be met; since neither excess of food in the stomach, nor hæmorrhages, are the result of a process of assimilation, while, on the other hand, there is a distinct process of assimilation in the formation of tumours, tubercles and all inflammatory products. But should not the meaning of the term be restricted still further?

There is a very general undercurrent of belief that a new growth should have a certain degree of individuality and coherence. If these elements are added to the definition most inflammatory products will be excluded. The disadvantages of this proceeding are, not only that tubercle will be included and pus excluded from the definition, and thus separated from their natural connections, but that what are called chronic inflammatory exudations and pus will also be separated from each other. I see no alternative, therefore, but to leave individuality and coherence out of the definition. A *growth*, therefore, according to this definition, will include tissues having incoherent units like pus as well as those having coherent units like cancer, and pus will come within the range of this definition when it is formed even on a free surface, since not only is the tissue from which it is formed tumefied, but, however little pus may adhere to the surface, it is still an assimilative accumulation of organic materials. And if pus is included in the definition, there is no reason to exclude the tumefactions of erysipelas, the pustules of small-pox, and even the minute red points of scarlet fever. I shall define a pathological growth, therefore, as an abnormal assimilative accumulation of organic material in a certain locality of the body, and it is only in this enlarged sense of the term that I could consent to call tubercle a *morbid growth*. Our problem now is to differentiate tubercle from other kinds of growths.

The growths which come under the usual denotation of tubercle have loosely adherent units, so that if they formed upon the surface of the body they would soon become detached. It may, therefore, be expected that a tubercle cannot form upon either the external or internal surface of the body;—I say, as a general rule, because, although it would be impossible for a tubercle to maintain itself upon a surface of the body which is freely exposed to external incident forces, yet there are certain infoldings of the surface in which this would be quite possible. In the bronchioles for instance, which are lined by infoldings of the membrane covering the internal surface of the body, it might be possible for growths similar to tubercles to maintain themselves. And, indeed, bodies are found in the alveoli of the lungs so similar to the growths which are by common consent denominated tubercles that they can scarcely be distinguished from each other. Must the morbid bodies found in the alveoli be included in the definition of tubercle? It is generally admitted that on clinical, ætiological and anatomical grounds it is better to exclude these alveolar accumulations. It may be said that the alveolar accumulations are mere mechanical aggregations of units, and are, therefore, not growths within the range of our definition, and if not growths they cannot be tubercles. If this is true there is no occasion to make a special provision in our definition to exclude them. The distinction is, however, too refined and too hypothetical for practical purposes, and it would be unsafe to trust to it. If we say that tubercle is a growth which forms in a tissue which has descended from the serous layer of the embryo, this will exclude the alveolar accumulations, since they are of an epithelial character. But, according to the researches of Dr. Burdon Sanderson and others, the localities in which tubercle occur are characterised by the presence in health of lymphatic or adenoid tissue. If this opinion should be confirmed by future researches, it constitutes a real and important discovery, and will aid us very materially in giving a definite connotation to tubercle. I shall, in the meantime, accept Dr. Burdon Sanderson's views, merely remarking that, if they are not confirmed by subsequent observations, the definition must be modified accordingly. According to these views, then, tubercle is an *adenoid* growth. It is not meant by this that tubercle is a growth more or less similar to lymphatic or adenoid tissue, but that it grows in that tissue, and that, in the terminology of Virchow, it is not a *heteroplastic,* but a *hyperplastic* formation. This part of the definition, therefore, not only excludes the alveolar accumulations, but all other growths which do not occur in a locality which is characterised in health by the presence of adenoid tissue. But the most opposite kinds of growth may occur in adenoid tissue, such as pus, lymphomata, and cancer as a secondary formation. The definition must now be framed so as to exclude all these.

If tubercle is compared with cancer and other growths, such as tumours, which have high powers of self-maintenance, we find that the former is characterised by being composed of cells similar to lymph and white-blood cells, while the latter have cells which are very considerably differentiated from such elementary units. If we now say that tubercle consists of lymphoid cells, this will sufficiently distinguish it from those growths which have a distinct individuality, like cancer and from tumours generally. By *lymphoid cells* is simply meant that the units of which the growth is composed are more or less similar to lymph cells, and it involves no theory of their derivation. It is equally descriptive of tubercle whether its units are derived from proliferation of pre-existing cells, or from migration of white blood-corpuscles. It may also be added that *cells* are used here subject to the recent change in the theory of the nature of these elementary bodies, and that it is not meant that they are made up of cell-walls and contents. With this addition, the definition is, that *tubercle is an adenoid growth consisting of lymphoid cells.*

The definition, however, does not draw any distinction between tubercle and leucæmic growths and lymphomata. The most obvious differences between tubercle and these growths are that, in the former, the cells are more aggregated than in the latter; and that in tubercle the circulation is obstructed, while the other growths are vascular. Which of these characteristics shall we select as a means of differentiation? Or is it necessary to include both differences in the definition of tubercle? If we say that tubercle is an adenoid growth consisting of closely-aggregated lymphoid cells this will undoubtedly serve, to a certain extent, as a distinguishing mark between tubercle, on the one hand, and leucæmic growths and lymphomata, on the other. It may, however, be asked how close must the aggregation be to constitute tubercle, and a difference in degree is too indeterminate to serve as a good characteristic in a definition, unless, indeed, we can give it a quantitative expression, which is impossible in this case. If we now turn to the other distinction, and say that tubercle is a non-vascular adenoid growth, this of itself will be amply sufficient to distinguish it from the other growths, and it will be perfectly superfluous to add that the cells of which it is composed are closely aggregated, since this is implied in its other characteristics. The only objection is that in its very early stage tubercle may not be absolutely non-vascular, but the vessels become obliterated so soon that non-vascularity is as good a characteristic as it is possible to obtain in order to distinguish between growths which in their early stages merge almost insensibly into one another. Our definition now is, that *tubercle is a non-vascular adenoid growth consisting of lymphoid cells.*

This definition is still very imperfect since it does not distinguish between tubercle and a circumscribed abscess occurring in adenoid tissue. What now is the most distinguishing characteristic between tubercle and pus? When pus occurs upon either the internal or external surface of the body it cannot be confounded with tubercle. The former can only be mistaken for the latter when it occurs in a locality characterised during health by the presence of adenoid tissue. But when pus does occur in such a locality both it and tubercle are non-vascular, both consist of lymphoid, and even of closely aggregated lymphoid cells, and it is possible for both to be similar to one another in outward form. How can they be distinguished in such circumstances? The most obvious distinction is that the cells of pus are moveable upon one another, while those of tubercle cannot be so moved without destruction of the growth; the cells of the former are incoherent, and those of the latter coherent. Tubercle, therefore, as we now regard it, *is a non-vascular adenoid growth consisting of coherent lymphoid cells.*

There is one other characteristic which should not be left out of the definition of tubercle. One of the prominent features of the growth is that it is disseminated through the body. Whether the disease spreads through infection, or through the mechanical irritation caused by the absorption of small particles of decaying matter during the softening of the growth, is not yet determined. And although my own opinion is that the disease spreads, like pyæmia, by an infective process, it is necessary to avoid the inclusion of a theory of infection in our definition. The essential facts will be included if we say that the growth tends to become multiple, or, in short, that it is *generally multiple.* I say *generally* because it is possible for a growth to be tubercle, even when it is not multiple. The disease must have a starting point, and the first growth may be tubercle even before there is a second, although this is by no means always the case. The definition as thus amended is, that *tubercle is a non-vascular, generally multiple, adenoid growth, consisting of coherent lymphoid cells.*

But, although this definition serves to mark off tubercle more or less clearly from other growths, it is essentially defective. It fails to convey an adequate conception of all the growths which are usually called tubercular. This definition is descriptive of grey tubercle, and is only very partially applicable to the other forms of the growth. We must now endeavour to amend our formula so as to embrace, as far as possible, all the forms of tubercle. If we take a wide glance at the series of morphological changes undergone by organisms during the entire time of their individual existence, we shall find that they may be divided into three principal stages. The first is the stage of simple growth, which is usually accompanied by a process of differentiation; in the second stage, which represents the mature condition of the organism, the increase in size either ceases entirely or becomes very inconspicuous, while the changes which take place are represented mainly by processes of differentiation. The most marked feature of the last stage is a degenerative process, which is sometimes, but not always, accompanied by a decrease of size. These three stages—the *Aufbildung, Umbildung* and *Rückbildung* of Haeckel—may be traced not only in the life-history of physiological individuals (with very rare exceptions), but they may be equally noticed in that of the groups of individuals which constitute races, kinds and species, and in the parts of individuals which constitute organs and tissues, and even frequently in the life-history of the individual cells of which the tissues are composed; and these three stages can be more or less distinctly traced in the transformations of tubercle. The most marked feature of the first stage of tubercle is the rapid multiplication of cells which take place—a multiplication so rapid that the capillaries of the part are pressed upon and obliterated. The stage of growth is, then, very distinctly marked. The stage of differentiation is, however, very inconspicuous; and this is only what might be expected, considering the rapidity of the growth. Other things being equal, there is an inverse ratio between growth and differentiation. When an organism is highly differentiated the growth is slow, and *vice versâ*. There is no organism so highly differentiated as man, yet there is no organism which grows so slowly. But, although the stage of differentiation in tubercle is not well marked, yet there are slight indications that it is not entirely absent. The formation of the reticulum, in which the cellular elements of the growth become embedded, is, to some small extent, a process of differentiation. Even the absorption of the fluid of the growth which occurs at this stage is some evidence of a similar process, although there is some reason to believe that such absorption attends the incipient stage of degeneration. Processes of differentiation are, upon the whole, accompanied by consolidation of tissue, a rule which is well exemplified by the fact that the chrysalis during its transformation loses weight and bulk. The consolidation of the tubercle which occurs at this stage may, therefore, be taken as an indication of a process of differentiation. The change which tubercle undergoes at this stage has been called the fibroid degeneration; but, although I do not deny that degenerative changes do take place at this stage I shall simply call it the fibroid change, a term which involves no theory of the process. But if the stage of differentiation is hardly discernible in the life-history of tubercle, the stage of degeneration is probably the most conspicuous and important of all. The fatty degeneration of tubercle, with its subsequent softening and ulceration, are so well known that I need not describe them here. I shall only remark that, other things being equal, the time occupied by the stage of degeneration bears a direct ratio to the time occupied by the stage of growth. The more rapid the growth the less conspicuous will be the stage of differentiation, and the more rapid will be the stage of degeneration. The longer the stage of growth the more marked will be the stage of differentiation, and the slower will the degenerative changes be in leading to the destruction of the growth. It is, therefore, apparent that the rate of progress of the primary stage of growth may lead to an almost endless diversity in the morphological appearances of tubercle.

These remarks show that the changes which tubercle undergoes are strictly analogous to the changes which take place in the life-history of organic individuals, of parts of individuals, and of groups of individuals; and this brings the morphological changes which occur in the life-history of tubercle within the scope of a very wide generalization. We might, therefore, content ourselves with summing up the results obtained in the briefest possible language, and adding them to our definition. But before we can give complete unity to our representation, we must not only know that changes do occur in tubercle in a certain order, but we must also know *why* they occur in this order, and *why* strictly analogous changes fail to be recognisable in allied growths. Before these questions can be satisfactorily answered we must regard tubercle not, as hitherto, in its statical, but in its dynamical relations,—not its morphology, but its physiology,—employing the latter term in the widest acceptation of the term. From the bare contemplation of the *product*, we must now pass to the consideration of the *process* which underlies its formation.

When a living tissue is irritated its cells begin to proliferate, and it is now proved, that, under these circumstances, there is not only a multiplication of existing units, but also a migration of other units to the locality. Starting from these facts, without waiting to ask if an explanation of them is possible, we may notice the similarity of this process to what takes place in a certain district of a social organism under the stimulus of a sudden prospective increase of production. Not only do the individuals who already live in the district marry earlier and multiply more rapidly, but immigration takes place from other parts of the social organism. But whenever the units of a locality, whether of the individual or of the social organism, increase in number, no matter from what cause, it is evident that the required nutriment and the mode in which it is distributed and expended must undergo corresponding changes. If the regulative and distributive agencies undergo adaptive modifications corresponding to the increase in the number of the units which expend the nutriment, then the locality may become organised as an integral part of the whole. But if the structure of the part fails without being replaced by new structure, the molecular motion expended by the units cannot be balanced by an equivalent amount from absorbed nutriment, and consequently the units must either migrate or starve. The units may be said to *migrate* either when they disperse through the organism or when they become detached while living, no matter what may be their subsequent history; and they *starve* when the forces expended are not replaced by equivalent forces from absorbed nutriment, and it is needless to add that the latter condition when prolonged must be accompanied by a high rate of mortality. These remarks are as applicable to the units of which an individual is composed, as they are to the individuals which compose a social organism. Let us now confine our remarks to the *cell* or unit of which the individual organism is composed.

When a tissue is subjected to great irritation the subsequent multiplication of units is so great that the original structure of the part disappears, and the organised tissue is replaced by pus, a tissue which consists of freely moving units and destitute of structure. The implication is that the part has absorbed a large part of molecular motion, all of which is devoted to multiplication, and none to that orderly arrangement of units into a coherent whole which constitutes organisation. What is the subsequent history of this tissue? When the pus forms upon a free surface its units become detached almost as soon as formed, and with this emigration from the parent organism ceases their interest for our present purpose. Again, when pus forms within the body it generally makes its way to the surface of the body by an extension of the process which first produced it, and by its units as it were feeding upon their more orderly neighbours. But no matter how the units make their way to the surface, they may be said when the abscess bursts to emigrate in a body, and their subsequent history does not concern us at present. But either some or all of these units may disperse through the organism. Passing over the condition of the surrounding textures which facilitates this dispersion, I shall briefly notice the kind of pus whose units become easily distributed. Along with the disintegrating process involved in the formation of pus there goes a corresponding absorption of molecular motion. When the irritation is excessive the disintegrating process will be rapid, and there will also be a correlative absorption of molecular motion. Under such circumstances a tissue forms which is fluid, with very incoherent units, showing a large amount of mobility; one in which the multiplication of units is rapid, and consequently their bulk diminished. It is scarcely necessary to add that this fluid tissue with small rapidly multiplying units may easily become dispersed throughout the organism. The laws of distribution of such tissues and the effects they produce upon the organism may be passed over at present. Their subsequent history belongs to pyæmia and septicæmia. It is obvious, however, that, when the units become detached or dispersed throughout the organism, the morphological stages of differentiation and degeneration cannot become developed in the locality primarily affected.

But the units of pus and allied tissues do not at all times either separate or dissipate. What becomes of them in that case? When pus forms in the tissues the growth is so rapid that the regulative and distributive nutrient agencies, the nerves and blood-vessels, disappear; and consequently if the units are not sufficiently active to migrate, or to feed themselves by breaking down surrounding structure and thus making their way to the surface, their subsequent history may be summed up in one word—starvation. When pus forms within the body the proper tissues of the part become pushed aside; and as the units of the pus increase in number they become further removed from the nutrient juices, so that by-and-by whatever amount of molecular motion is expended by them is not replaced by the absorption of a corresponding amount from the surrounding medium. What, then, must be the morphological change which corresponds to this necessary molecular change? The first loss of molecular motion declares itself by the drying of the pus, which is accompanied by an approximation and shrinking of its units. This external change is in all probability accompanied, and in great measure caused, by a deeper chemical change. The proteinaceous substance which forms the protoplasm of the pus-corpuscle falls into a lower isomeric state,—a portion of water is thus set chemically free which is absorbed by the surrounding tissues. When the morphological changes in the life-history of tubercle was under consideration it was noticed that the consolidation of tissue which occurs was some evidence of a process of differentiation, but the drying of the pus can scarcely be regarded in this light. Everything points to the conclusion that the stage of growth gives place to that of degeneration without the intervention of a stage of differentiation. Subsequent to the drying of the pus loss of molecular motion declares itself by fatty degeneration. Without entering into the details of the chemical changes which accompany this transformation, the great point for us to notice is that the high molecular complexity of the proteine of the protoplasm is in great measure replaced by the lower molecular complexity of a hydrocarbon. If fatty degeneration proceeds rapidly before the pus has lost a large part of its fluid, the living units completely break up, and the product is converted into an oleo-albuminous fluid which Virchow calls "pathological milk," which is subsequently absorbed. If, on the other hand, the fatty transformation proceeds more slowly, while the pus has previously parted with a large part of its water, the units may retain more or less of their form, and this gives rise to what is called *caseous* pus.

If we carry these conceptions with us to the consideration of tubercle, we will not require to say much with regard to the mechanism of its transformations. We have just seen that in a circumscribed abscess the stage of the growth of the pus is succeeded directly by that of degeneration, while we have previously seen that in tubercle there is interposed between these a stage which, even if accompanied by some degenerative changes, is yet one mainly of differentiation. Why should a stage of differentiation appear in the life-history of tubercle, and not in that of pus, even when it forms in adenoid tissue? This depends upon the rapidity of the growth of the one, and the comparative slowness of the growth of the other. All the nutriment absorbed by the pus-corpuscles is devoted to their multiplication, hence the tissue breaks up into independent units; and the fact that the units of tubercle remain coherent shows that of the available nutriment a small margin is left which is not devoted to multiplication. And when the multiplication of the units of tubercle is checked by the pressure of the surrounding tissues and by the obliteration of the capillaries, the balance of nutriment which was not devoted to genesis is left to produce a slight process of differentiation. That the presence of the stage of differentiation depends upon the comparative slowness of the growth is further confirmed when we notice that this stage is the more conspicuous according as the growth of the tubercle is slow. So much is this the case that in the very slow growing tubercles the fibroid change which takes place is the most marked feature of their history. And even if we do not choose to extend the term tubercle to any growth in which the stage of fatty degeneration is absent, yet there are closely allied growths having a slow rate of progress in which the stage of degeneration either entirely fails or is not readily discernible. If the object of this paper were to discuss tubercle in all its relations, it would now be necessary to consider the various terminations of the growth; but, since the object is to arrive at a good definition, it is quite unnecessary to carry the discussion further. That tubercle ends in excavation, cretification or obsolescence, is a most important part of its clinical history; but the terminations of a growth have no right to be included in its definition. A cavity, for instance, is neither tubercle nor an attribute of tubercle, and, therefore, has no legitimate claim to a place in its definition, and the same may be said with regard to the other terminations.

A consideration of the statics of tubercle has led us to the conclusion that the morphological changes of tubercle present three stages —one of growth, one of differentiation, and one of degeneration; and a consideration of its dynamics has confirmed and in great part explained this conclusion. The question we have now to determine is how best to include the transformations of tubercle in our previous formula. The formula was—that tubercle is *a non-vascular, generally multiple, adenoid growth, consisting of coherent lymphoid cells.* We have now to notice that this is only descriptive of tubercle in its first stage, and that it subsequently undergoes transformations, the first of which we may call the *fibroid change,* and, lastly, a fatty degeneration, which is generally called *caseation.* The definition, as amended by the addition of these elements, is—that *tubercle is a non-vascular, generally multiple, adenoid growth, consisting in its first stage of coherent lymphoid cells, and subsequently undergoing a fibroid change and caseation.*

In conclusion, I shall endeavour to remove one or two objections which may be advanced against this definition. Some may think that we ought to state in it that the growth is morbid; but a definition of a morbid tissue, in order to be adequate, ought to distinguish it from healthy as well as from other diseased tissues, and if our definition is not already adequate for this purpose it will not help us much to state that the growth is morbid. Imagine any one defining tubercle, with a view to distinguish it from cancer, by saying that it was a non-cancerous growth; and this is only a similar proceeding to that adopted by those who would distinguish between tubercle and healthy tissues by saying that the former is morbid, or, in other words, is not healthy. But the principal objection to this and to other definitions of tubercle is that it does not enable us to distinguish at all times between it and allied growths. But those who urge this objection seem to forget the nature of the facts with which we have to deal.

Objective differences never exactly correspond to subjective distinctions, and this is particularly the case in the present instance, since tubercle is surrounded on all sides by growths with which it is connected by transitional forms. Between tubercle on the one hand and scrofulous and leucocythæmic growths, lymphoma, pus, connective-tissue proliferations, epithelial accumulations in the alveoli, and fibroid on the other, there not only are, but there must be, intermediate forms in which it is impossible to determine whether a particular growth comes within the range of our definition or not. This difficulty, therefore, arises from the nature of the facts with which we have to deal, and no definition, however perfect, can ever entirely meet it. Similar difficulties of definition and classification are met with in all departments of biology. Botanists, for instance, meet with transitional forms which it is impossible to identify as belonging to a particular species, and if this be the case amongst organisms where the principle of natural selection has, to a large extent, produced extinction of the intermediate forms, how much more must it be the case amongst growths where no principle of the kind is in action.

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GLEANINGS FROM OBSTETRIC CASES.

BY J. ARMSTRONG, M.B.,
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On the treatment of hæmorrhage in abortion at the third month.

THE hæmorrhage, in cases of abortion at so early a stage of pregnancy, is generally less formidable than that at a more advanced period, yet there are instances where the life of the mother is endangered from this cause. The various modes of treating this form of hæmorrhage produce very different results, therefore different stages require very different modes of treatment. For example, where there is every likelihood that the ovum will be preserved, the most judicious treatment is to apply a local styptic, such as perchloride of iron, and to administer a sedative to prevent further uterine contractions. If, however, judging from the large amount of hæmorrhage that has taken place and from the dilated condition of the maternal parts that the expulsion of the ovum is inevitable, and failing in the attempt to empty the uterus, it is the best practice to stuff the vagina with small pieces of sponge or to plug the cervix, in order to dilate the cervical fibres as well as control the hæmorrhage, and to administer ergot in order to encourage uterine contractions.

It is to the mode of treating the hæmorrhage in cases where the expulsion of the ovum is inevitable that I wish particularly to allude. If the hæmorrhage is severe, either plugging the vagina or the cervix may be had recourse to. The action of the vaginal as compared with the cervical plug, if I may be allowed to use the terms, is very much the same; the former dragging the os open after it has become saturated with blood and stiffened, the latter dilating the cervix direct. The material used to make the plugs may be the same. I prefer one of Barnes's dilators for a cervical plug rather than a sponge, as it is less likely to be expelled on any exertion, because of its dumb-bell shape.

In two cases where I used the cervical plug I found it as effectual in controlling the hæmorrhage as plugging the vagina; it is more convenient, less troublesome, and much less disagreeable to remove, for all of which reasons it is not only more pleasant to the obstetrician, but must be also more favorable to the mother.

Disadvantages from the use of ergot.

I. *In causing or aggravating hour-glass contraction of the uterus.*—With some obstetricians it is a recognised practice in tedious cases of labour, where the pains are frequent and of short duration, and especially if there be any previous history of hæmorrhage, to administer a dose of ergot either shortly before or immediately after the birth of the child as a preventive of hæmorrhage. The effect of ergot is to produce uterine contraction, which, though equable, reduces the uterus to a more narrow compass where no resistance offers. If we consider the changes in the uterus at the termination of the second stage we generally find, that the pains which expel the body and lower extremities detach the placenta and dislodge it into the vagina; or it may remain in the cavity, to be expelled by further contractions. Often, however, the placenta is not detached so soon, here the ergotized uterus contracts around the placenta *in sitû*, the cervical zone contracting most narrowly, there being nothing to resist it. The seat of the so-called hour-glass contraction is immediately below the attachment of the placenta. This accounts for the rigid condition of the circular band, which is kept up by pulling at the cord.

I am convinced that a great number of cases of hour-glass contraction of the uterus are caused, and if not caused are greatly intensified, by giving ergot at this time.

II. *In primiparous cases.*—The only circumstance where the use of ergot in primiparous cases before the completion of the second stage is justifiable is where the maternal passages are roomy and dilatable and the head resting on the perinæum. Although the head may rest on the perinæum and the pains be feeble in expulsive effort, ergot, by exciting to continuous uterine contractions, endangers the entirety of the uterus and perinæum, and also the life of the child.

The careful use of the forceps is much better practice.

III. A third disadvantage from the use of ergot occurred in a twin case after the birth of the first child, which was natural. The practitioner in attendance, finding the second child presenting by the head, and there being no pains present, administered a dose of ergot. The uterus contracted violently around the child, producing much pain, but no progress in the labour. I was asked to see the case, and on examination found the os firmly contracted. I advised a full dose of Battley's sedative, which relieved the pain and procured some hours of sleep. After five hours I saw the case again, when the os was dilatable, and, hæmorrhage supervening, I was induced to turn and deliver the child as soon as possible.

There is no doubt that ergot was the cause of the delay in the birth of the second child, yet ergot was indicated when a sufficient length of time had elapsed without pains having supervened.

Remarks on a case of hydatidiniform degeneration of the ovum.

The great danger to be feared in these instances is exhaustion from frequent and copious hæmorrhages. Such a case lately came under my care. The hæmorrhage had recurred frequently before I saw her, and so great was the exhaustion produced that the patient never rallied, although the hæmorrhage ceased after the removal of the hydatidiniform mass. Dr. Meigs regards this degeneration as depending upon "a hydropic state of the villi of the chorion, which by a process of endosmose under some maladive condition of the life-force of the ovum, is able to convert them into cysts, to the ruin of the product of the fecundation."

Where such a state of things exists it is of the utmost importance that the diagnosis should be made early. In the case I mention there was no difficulty, because of the dilated condition of the os uteri, from the rapid increase in size of the abdomen compared to the previous pregnancy, and from the presence of watery vesicles in the discharges and upon the finger after examination.

A correct diagnosis having been made, it is in the mother's favour that the uterus be emptied of its contents as soon as possible. If the os is not dilatable it should be artificially dilated, so as to allow the hand to be introduced in order to scoop out the hydatidiniform mass. Without doing this we cannot be certain that the whole is removed, as the mass may be adherent to so large a uterine surface, and if not wholly removed the hæmorrhage is likely to persist. When the whole mass has been removed and yet the hæmorrhage does not cease, the uterus must be swabbed out with perchloride of iron. The use of ergot is also an adjuvant in keeping up uterine contraction.

DETACHED NOTES ON SOME SYPHILITIC AFFECTIONS OF THE EYE.

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A FEW brief notes illustrating some of the effects of syphilis upon the nervous structures of the eyeball may not be without interest.

The first to claim attention are inflammatory changes occurring in the optic nerve or retina (separately or together) during the "secondary" period of syphilis; they correspond with or closely follow the papular or squamous eruptions, the early iritis, &c., and may be looked for, as a rule, in the first eighteen months after infection.

The condition of the system in this stage is marked by a modification (more or less profound, according to circumstances) of the whole nutrition. This has hitherto been most easily seen and most closely studied in the skin. Briefly, it may be described as culminating in limited patches of plastic "inflammation," indolent and tending very slowly towards resolution, suppurating only in cases of a pre-existent pyogenic habit, but in subjects of an average standard maintaining its character of a deposit, capable of cure by degeneration and absorption, without necessarily inflicting destruction upon the normal elements of the tissue in which it has occurred. That this particular change takes place by preference in certain localities is undoubted, but we must bear in mind that there is no reason to suppose that the tissues of other parts of the body are incapable of undergoing the same modified growth, albeit they seem to be, as a rule, exempt. Increased carefulness and improved means of observation will show us the area of action much enlarged. Already in a few years the ophthalmoscope has enabled us to *see* in the retina and optic nerve changes that were not even guessed at, and to deduce intra-cranial mischief with a very considerable amount of certainty.

It is with these changes we are now especially concerned. The starting-point may be a chronic inflammation of the meninges contiguous to any part of the nerve-trunk, or in the connective tissue of the nerve itself, in either case passing down in continuous proliferation to the retina, constituting a species of neuritis descendens, or, on the other hand, commencing in the connective elements of the retina and thence spreading upwards towards the brain, constituting a neuritis ascendens. In the majority of cases seen the upward or downward route is but incompletely travelled, many cases of neuritis stopping short at the disc, and cases of retinitis failing to involve the trunk. The pathological process, whether limited or extended, is identical; the symptoms offer some variety.

Retinitis in syphilis is, I think, tolerably frequent. I have in a few cases satisfied myself of its existence during early iritis, when, of course, without a special examination it would be masked by the more superficial disease. Any accurate observation of the deeper tunics during the active progress of iritis is so obviously difficult that it is scarcely possible to form any opinion of the frequency of the coincidence. In some cases I believe retinitis escapes observation altogether. I have in more than one case detected it before the patient's attention had been directed to the eyes by any marked symptoms.*

In those cases free from iritic, choroidal, or hæmorrhagic complications central vision is often so little impaired that the patient can read No. 3 or 3½ Snellen with no difficulty, and consequently is not embarrassed by ordinary sized print. As the disease progresses the acuteness of vision slowly but surely diminishes, till at length, with but comparatively little turbidity of the media, No. 20 is painfully read at a few inches from the eye. From the beginning, however, the periphery of the visual field is remarkably contracted, and this condition is most persistent during the whole course of the disease. In some cases patients, without understanding the cause, complain that they jostle passers-by and cannot cross the street with safety.

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* Syphilitic patients may be divided into two classes—(*a*) Those who, from a natural buoyancy of disposition, or from a belief that the initial lesion, the corona veneris, or the loss of a nose, are the main effects of "the venereal," are consequently careless of less prominent symptoms, looking upon the sore throat as a cold, iritic neuralgia as tic, and ascribing even amblyopia to the ill-effects of wind or gas light, and who consequently have to be frequently reminded of the necessity for care. (*β*) Those who are morbidly affected, who examine every falling hair with anxiety and every pimple with alarm, whose lives for months (or it may be for years) are spent in a terrified bogy-hunt, and who only too frequently suffer in body and pocket from the physic and rapacity of the quack.

Photophobia is seldom present in any marked degree, but exposure to a bright light gives rise to a dull deep-seated pain. Flashes of fire and globes of green or of red light are of common occurrence. Inability to see in the dusk obtains throughout the course of the disease, and remains a troublesome symptom for some time after active mischief has disappeared. Vision for colour is in some cases not affected, in others very remarkably. To this symptom I hope to refer at a future period in some detail, noting at present that the two secondary tints, green and purple, are in the majority of cases the stumbling-block; the former being undistinguishable from its primaries (more especially blue), the latter altogether losing its identity and appearing dark brown or black. This approaches in character the effect of a yellow light, such as the sodium flame upon a healthy retina.

The changes visible by the ophthalmoscope are, in the beginning, increased vascularity and a gradual substitution of an irregular foggy grey tint for the normal retinal transparency; it is as if the choroid were covered with a thin layer of milk-arrowroot. The effusion, probably at this stage serous, is irregular in its distribution, and is generally seen in the neighbourhood of large veins, or invading the macula, or surrounding the edge of the disc, which appears blurred and indistinct, although its proper surface may yet be focussed clearly. A peculiar dotted appearance, like the stippling in miniature flesh-painting, is often to be observed in portions of the fundus. As the disease progresses small nodules of lymph are thrown out. They are almost invariably on the course of the large veins whose circulation they not unfrequently impede. They are irregular in shape, raised, with woolly edges, surface white, strongly reflecting light, and sometimes bounded by a deposit of pigment. They are frequently mistaken for atrophic patches, but may be distinguished by observing that the veins in relation are enlarged rather than diminished, or may be traced passing beneath the deposit or thrust on one side by its protuberance. It is somewhat more difficult to diagnose them from the patches of albuminuric retinitis. These are generally more brilliant, but inclining rather towards yellow than pure white in tint, larger, more symmetrical, accompanied by numerous hæmorrhages. This last characteristic is, in my experience, very rare in syphilitic retinitis. In one of Leibreich's drawings a large hæmorrhage is figured, but it is described as unusual. Fig. 1 represents the condition I have attempted to describe. The drawing was taken from the left eye of a patient in whom other secondary symptoms had nearly disappeared. The right eye was very slightly affected. The fundus was somewhat pale, veins much enlarged and tortuous, edge of the disc slightly blurred at the apparent inner and upper third, the lower third occupied by two prominent patches of effusion, in one case surrounding, in the other pushing aside, the large vessels in immediate contact. There were no hæmorrhages, no depositions of pigment, nor did the optic nerve become affected.

The outline of a case in which the inflammatory process began in the intra-cranial portion of the tract and travelled downwards to the retina will exemplify the leading features of the descending variety. A young man contracted a chancre in July, 1872. This seems to have healed readily under treatment. He applied to me in the course of the September following with some psoriasis palmaris, papular and pigmented eruption over the body, sores in the fauces, mucous tubercles on the tongue and angles of the lips, cervical and inguinal adenopathies well marked. His general health, appetite and strength good. Under treatment he soon began to improve and ceased to visit me, though I warned him of the advisability of keeping under supervision for a time.

After some months he reappeared, suffering much annoyance from the state of his tongue and mouth. He complained of vertigo and pain after using his eyes. With the ophthalmoscope the disc of the right eye was found to be tumid, of a violet or

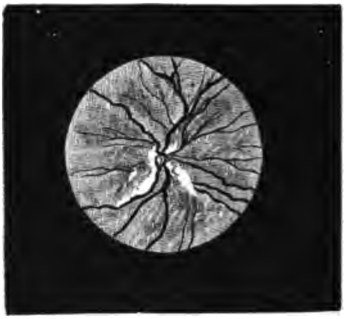

FIG 1.

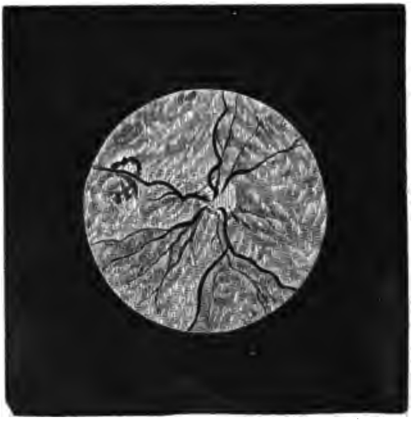

FIG. 2.

E. A. B. AD NAT. DEL^T.

purplish-grey colour, contrasting very imperfectly with the choroidal reflex under the strong light of the indirect examination, the veins large and tortuous, the arteries small but plainly distinguishable. The left disc was at this period very slightly affected, and the retina in both eyes unattacked. Notwithstanding my urgent warnings he absented himself from observation for more than a month, pursuing his medicinal treatment with some regularity, but absolutely neglecting to take care of his eyes. This course seemed to account for an improvement in the cerebral symptoms, but a marked deterioration in the condition of the eyes. I noted at the time, in the right eye, optic-disc red except porus opticus, edge just distinguishable from retina, reflexion hypermetropic, rest of fundus emmetropic (indicating considerable bulging), radiating vessels plainly visible and numerous, arteria centralis visible with a white outline, veins much dilated and tortuous, retina muddy, towards periphery one or two disseminate patches of pigment. Left eye optic-disc irregular, red, radiating appearance of fibres, vessels numerous but clouded, veins dilated and tortuous but not so kinked as in right eye, disc seen erect at distance but not so clearly as right, retina cloudy opaque. Subsequently deposits of lymph took place on the course of large veins in both eyes, central vision deteriorated somewhat, peripheral much contracted, almost absolutely blind in the dusk, confused blue with green, distinguished yellow plainly, pink and vermilion not very distinct, mauve nearly black, "very different from blue." Fig. 2 is from a careful sketch made shortly after the inflammatory process, having reached this limit, had begun sensibly to abate. The points illustrated by this case are the proneness of inflammatory action in nerve structure to spread by conduction from a focus once set up; the possibility of a severe retinitis existing for some time without involving other tissues (for at no period could I detect choroidal or iritic complication); the possible immunity of the macula from serious injury during a period of months (shown, I think, by the condition of central vision as well as by absence of ophthalmoscopic signs), and the ill-effects of neglecting local hygienic precautions, functional rest, &c., even when the mischief is from a general cause.

During the tertiary period mischief may arise in the manner illustrated by the following case. A married woman, very thoroughly syphilized (but at what date I did not inquire for fear of raising connubial difficulties), suffering with a severe destructive ulceration of the left palate, tongue and larynx, and ozæna, all of a well-marked tertiary type, first came under observation with a lachrymal abscess caused by a partial necrosis of one nasal bone. As she complained of headache and some dimness of sight in the right eye, it was examined and the optic disc found to be irregular, much swollen, woolly, vessels large but blurred, the retina unaffected. The left eye normal. Now, although these symptoms correspond closely with those of optic neuritis as above described, the pathology is different. The condition is that known as the Stauungs-papilla, ischæmia papillaris, or choked disc. It is primarily due to arrest of the venous circulation, by either intracranial or orbital pressure. As there was no protrusion of the eyeball nor evidence of orbital mischief, it seemed not improbable that the cause was to be sought for in a localized meningeal affection, giving rise, perhaps, to a kind of node within the skull. The supposition was supported by the rapid relief afforded by full doses of iodide of potassium. It must be remembered in a case of this nature that the inflammatory process in the disc is entirely secondary to the original state of congestion produced by pressure at a distance, and is not in itself due to the syphilitic action. The congestion may be followed by a true local inflammation, which may spread by continuity to the retina or upwards along the optic nerve. By exactly the same mechanism at a later stage in the disease intra-cranial gummata may give rise to the same series of changes within the eyeball. In all these cases increase of connective tissue or atrophy of nerve substance, causing (in proportion to their extent) loss of function, must be looked upon as imminent. Many cases, it is true, recover with little or no damage, but such favorable results must not be expected in some instances unless a correct diagnosis is followed by a vigorous treatment, directed, not to the symptoms, but to the cause. From what I have said it will be perceived this is not always the same.

ON THE CONSTRICTOR ACTION OF THE INTERCOSTAL MUSCLES.

BY ARTHUR RANSOME, M.D., M.A.,
LATE EXAMINER IN ANATOMY AND PHYSIOLOGY AND PHARMACOLOGY TO CAMBRIDGE UNIVERSITY (1868—1869).

AMONGST the various actions which have been attributed by different observers to the two layers of intercostal muscular fibres, no note appears to have been taken of a function which may, I think, be fairly assigned to them, namely, the indrawing or constriction of the walls of the thorax. It is probable that the supposed rigidity of the bony levers—the ribs—has in some measure prevented the recognition of this action; and the fact that constriction of the chest-wall takes place only during forced breathing, would prevent it from being remarked in experiments upon the ordinary respiration of animals.

In Traube's remarkable series of vivisections ('Gesammelte Beiträge zur Pathologie und Physiologie') there are, indeed, indications that in the difficult breathing produced in rabbits by section of the inferior laryngeal nerve the lower ribs are drawn inwards, probably by the action of the diaphragm, and the same influence is to be remarked in the cases given by Mr. Le Gros Clark in the 'Proceedings of the Royal Society,' vol. xx, p. 125.

I have, moreover, myself brought forward evidence, both from actual experiment and from stethometric measurements, which proves that the upper ribs, as well as the lower, are usually pliable to a considerable extent in living subjects;* and the fact that in forced breathing in man, a distinct change takes place in the chord lengths of the ribs may readily be demonstrated by means of measurements with suitable callipers.†

It is important that the fact of this bending of the ribs should be fully recognised before an attempt is made to explain by what forces it is produced, and the discussion of the difficult question of its causation should not be allowed to prejudice the observations upon which it rests. That the ribs do bend in forced breathing may be seen by any one who will use the suitable instruments; how they are bent is much more difficult to prove. It is, however, necessary that the subject should be fully considered, and I venture to adduce the following reasons for assigning to the intercostal fibres a large share in the work.

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* 'Proceedings of the Royal Society,' No. 139, 1872.

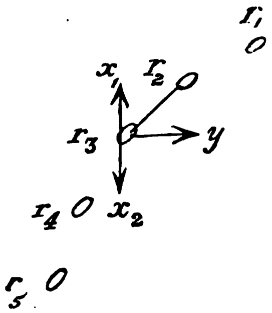
† Also the subject of a communication to the Royal Society, but not yet published in the 'Proceedings.'

Since the change in the curvature of the ribs takes place, not only in the lower portions of the thorax to which the diaphragm and abdominal muscles are attached, but also as high as the third or even the second pair of ribs, it is evident that it must be effected by some of the intrinsic thoracic muscles.

But it is probable that no muscles are so advantageously placed for performing this duty as the intercostal fibres. When the first ribs are fixed by the cervical muscles, and the lower ribs are drawn downwards and even inwards by the abdominal group, then any fibres between the other ribs acting in concert, whatever their direction, will necessarily draw inwards the intervening bony hoops.

The shape of the thorax is such that, if the ribs below the first are capable of being bent, they must be drawn inwards by the contraction of muscles placed between them.

FIG. 1.



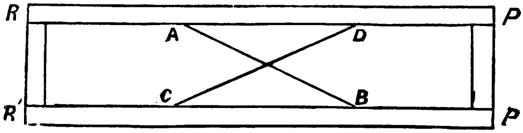
From the first to the seventh the rib circuits descend in widening diameters, and the planes of the intercostal spaces, instead of being vertical, are more or less inclined. The force exercised by the muscles in these spaces may therefore be resolved in a vertical and a horizontal plane, and the amount of power drawing inwards along the latter plane will, *cæteris paribus*, depend upon the obliquity of the intercostal plane, and will be greatest in the upper part of the thorax. The tendency throughout, wherever there is any slope at all, will, however, be inwards.

Let r_2, r_3, r_4, r_5 (fig. 1), represent transverse sections of the 2nd, 3rd, 4th, and 5th ribs respectively, then any force acting between two ribs, r_2 and r_3, in the direction of the intercostal space, r_2, r_3, may be represented by the lines drawn in the directions x and y, at right angles to one another, and the lengths of these lines will depend upon the obliquity r_2, r_3.

Moreover, the oblique direction of the fibres of the intercostal muscles adapts them still more especially for a constrictor action.

When two elastic bands (A B and C D) are stretched crosswise between two bars (RP and R′P′) capable of being bent laterally, but not from above downwards, and which can only be approximated to a limited extent, then, when this approximation has been produced, the tendency of the further action of the bands is to draw together the ends of each bar. In the language of mechanics, the forces they exert may be resolved in the directions RR′ and RP, or R′P′ and *vice versâ*. If the bars are quite straight, no moving effect will follow, since the bars cannot then yield to the forces acting along RP or R′ P′, but they will be in a position of unstable equilibrium, such that the slightest curvature in the bars will at once permit the bands to contract, and a further bending will take place in the direction of the curvature so introduced.

FIG. 2.



Now, this latter case is precisely that of the ribs when acted upon by both external and internal fibres at one time, and since the rib-levers are free to move at their anterior extremities, and are more pliable and thinner at these points, it follows that the chief bending action will take place in the anterior wall of the chest, and a general indrawing of this part of the thorax will be the result. The effect of each fibre, or of each pair of fibres, is necessarily very small, but the aggregate power they can exert is probably quite sufficient for the purpose.

It is interesting to notice that in other parts of the body, wherever constriction of a cavity is required, there we find an oblique arrangement of muscular fibres generally in two layers running in opposite directions. In the abdomen, the external and internal oblique muscles, in the pharynx, the middle constrictor spreading fan-like, with its outer fibres directed across those of the upper and lower muscles. In the bladder and stomach the same arrangement is to be observed, and even in the heart, although the muscles are spiral in their arrangement, their fibres are so placed that they run in a similarly opposed fashion.

Viewed in this light, the intercostals may perhaps be regarded as two large muscles, having, like the rectus abdominis, ligamentous or bony portions placed at intervals in their course, modifying and in some ways increasing their power, but not altogether preventing them from exerting a combined influence, and so constricting the cavity of the chest.

This account of the *united* action of the intercostal muscles, working in concert with the external muscles of expiration, does not clash with the received doctrines respecting the inspiratory functions of the external intercostal, and inter-cartilaginous muscles acting independently, or together with the cervical and levator muscles of the ribs. The experiments of Traube on rabbits seem to be absolutely conclusive on this point. ('Experimentelle Untersuchungen,' p. 158.)

Again, the rib-depressing power of the internal intercostal muscles acting alone would still be possible, and they might also combine with the abdominal muscles to draw down the ribs after they had been raised by the levatores costarum and the other inspiratory muscles.

It is highly probable also that in the upper regions of the thorax the triangularis sterni assists in the process of constriction, and that the diaphragm and abdominal muscles produce some portion of the inbending of the ribs below the sixth.*

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* On these points I would refer to Mr. Le Gros Clark's "Remarks on the Mechanical Respiration," 'Proceedings of the Royal Society,' vol. xx, p. 122; to a paper "On the Action of the Intercostal Muscles," by Dr. Dwight, jun., in the 'Boston Medical and Surgical Journal;' to the first of Professor Humphry's Lectures on "Human Myology," delivered before the College of Surgeons, and to some remarks of my own "On the Action of the Intercostal Muscles," in the 'Brit. Med. Journal' for October 26, 1872.

The question of the indrawing and constriction of the chest-wall during forced expiration is not without much practical importance, since it bears closely upon the pathology of emphysema, and its production by asthma and chronic bronchitis.

In making stethometric observations upon persons suffering from bronchitis or phthisis, I have often noticed that whilst the patient has been making forced efforts at breathing, cough has come on, and the ribs have been immediately drawn inwards to a far greater extent than had been accomplished voluntarily, showing that the reflex stimulation of the muscles of expiration, by irritation of the bronchial mucous membrane, was able to accomplish far more than the power of the will.

Now, if in forced expiration, as in coughing, the lung should be compressed by the direct force of the indrawn ribs, then in the natural condition, this pressure will take place at the most favorable moment, when the lung is already partially emptied of air, and when the squeezing effect will be comparatively harmless; but if there is any obstruction to the free exit of air, as in bronchitis or asthma, then the lung will be caught in the position of partial inspiration, and, so to speak, will be taken at a disadvantage, with all its cells distended with air, and ready to be forced into any inequalities in the compressing walls. Here, then, we have an intensification of all the influences which have been considered as the expiratory causes of emphysema.

The subject is not without interest also in relation to the peculiarities in the movements of the chest-wall in pleurisy, emphysema, chronic bronchitis, and phthisis; but on these points I must refer to a paper on "The Respiratory Movements in Man," published in the last volume of the 'Transactions of the Medico-Chirurgical Society.'

NOTES ON A CASE
OF
ABSCESS OF GALL-BLADDER
WITH
DISCHARGE OF GALL-STONES THROUGH THE ABDOMINAL PARIETES.

BY J. EDWIN SCOWCROFT.

THOUGH this case is not without precedent, it is of infrequent occurrence and of interest as occurring in the male sex.

There are, I believe, about seventy such cases recorded which, with few exceptions, have occurred in females of middle or advanced age.

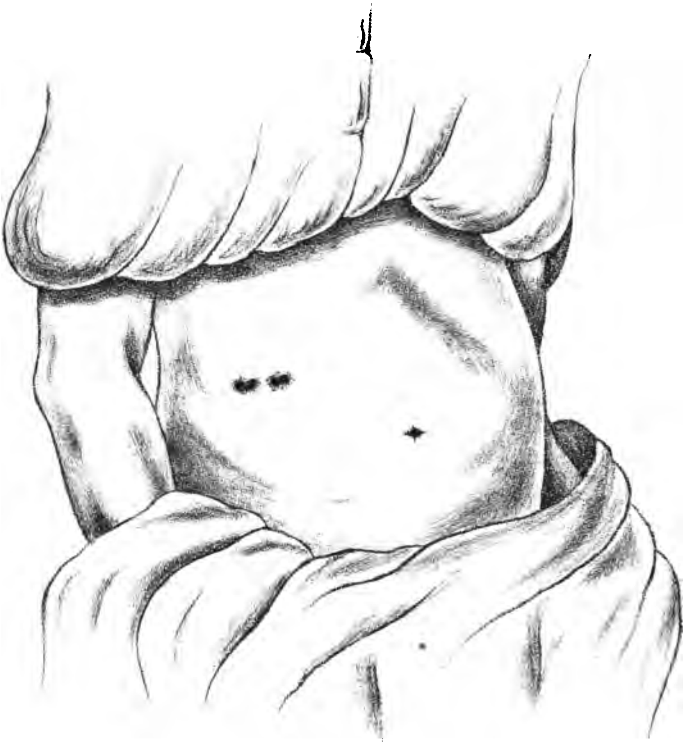
J. K—, æt. 50 years, a railway contractor, was attacked in April, 1871, with persistent pain in the region of the liver which gradually became worse, being attended with fever and other symptoms of constitutional disturbance. He had frequent attacks of vomiting; but there was no jaundice.

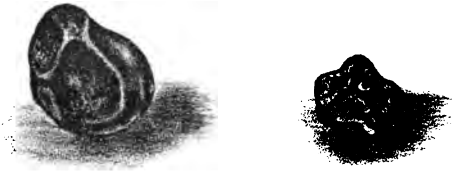
The pain and vomiting continued for about four months, at the end of which time an enlargement was noticed in the right hypochondriac region.

The swelling gradually increased in size for three months, when it burst and discharged a large quantity of matter mixed with a little bile.

The pain still continued almost as severe as before, and, indeed, in about three weeks from this time somewhat increased.

Being disturbed one night by one of his children crying in bed, he went to it, and, whilst in the act of "covering it up," a small biliary calculus escaped from the aperture which the ulcers had





Calculi natural size.

left—a second was discharged a week afterwards, and from this time until the 12th of May, 1872, two stones were passed each month. Many have passed since that time, the last one coming away in August of this year; the patient each time suffering a little pain for a few days previous to the escape of the calculi, but not so severe as to prevent him following his employment.

The man has indeed during the last six months been gradually gaining flesh, and both looks and is well.

The total number of calculi is fifty-three. Each calculus presents several facets.

The position of the fistula and size of the calculi are shown in the drawings.

TWO CASES OF EXCISION OF THE SCAPULA.

WITH REMARKS ON THE BEST MODE OF PERFORMING THE OPERATION SO AS TO AVOID HÆMORRHAGE.

BY DR. KELBURNE KING, F.R.C.S.,
SURGEON TO THE HULL INFIRMARY.

DURING the summer of 1869, Henry R—, æt. 26, a native of Grimsby, applied at the Hull Infirmary for advice regarding a tumour of the right shoulder. He had noticed it for some months, but it had not caused him any uneasiness till shortly before, when the pressure of the clothes on the part produced pain and led him to seek relief.

On examination there was felt above the spine of the scapula a round, perfectly hard and solid tumour about the size of an orange; not painful to touch or handle; not moveable, but firmly attached to the fossa supraspinata from which it sprung. The base felt broad, but at first it had very much the feeling of a round exostosis. Gradually, however, it extended across the spine and into the infraspinous fossa over the middle portion of which it rather rapidly extended. The use of the arm was now much limited. The pain was constant and interfered with sleep, though still it was not very severe; but his general health was suffering, and he was desirous that anything likely to relieve him should be done.

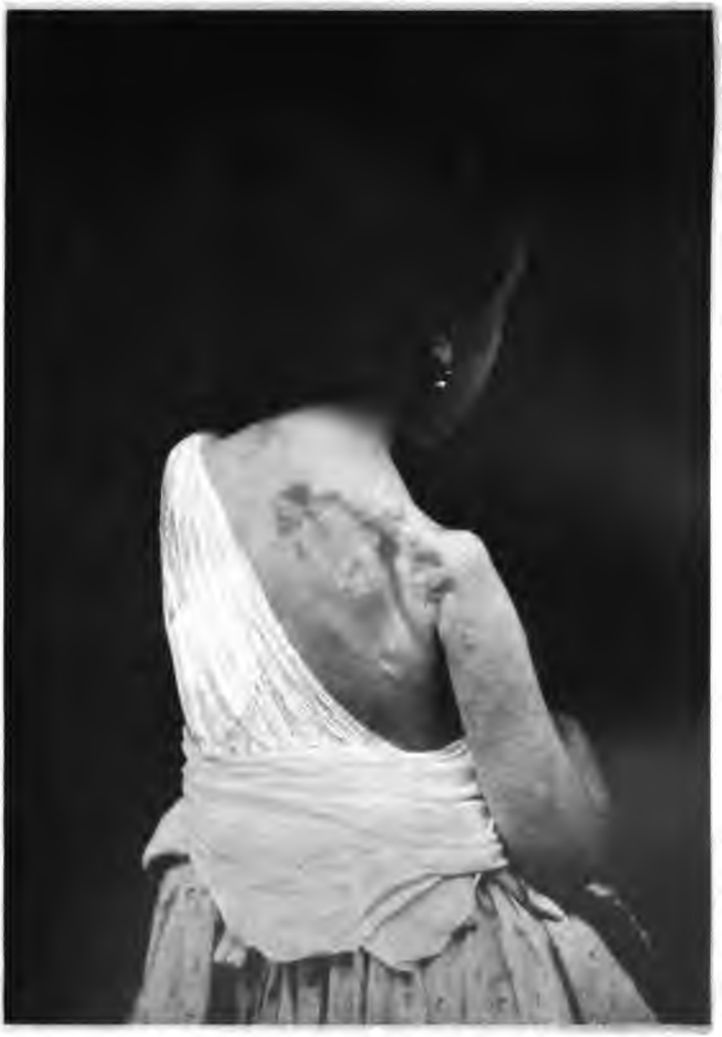
He was admitted an in-patient on October 11th. The whole dorsal aspect of the scapula was now occupied by the hard, firm, bone-like tumour, and, under the impression that it was a non-malignant tumour of the bone, I determined to excise the whole of the scapula external to the glenoid cavity, which seemed quite free from disease.

On the 20th October the following operation was performed :—An incision was made along the spine of the scapula from the base of the acromion process to the vertebral margin. The origin of the trapezius was then detached and the fingers were passed round the great bulk of the tumour in the supraspinous fossa. Owing to its size this part of the bone was easily pulled forward, and the supraspinal artery divided and easily ligatured without any loss of blood. Then placing the forefinger of my left hand on the axillary border of the scapula just behind the triceps muscle, where I could feel the pulsation of the dorsal artery, I entered the knife at the acromial end of the first incision and cut downwards to my left forefinger and about two inches past it along the axillary margin of the scapula; still pressing my finger on the dorsal branch I cut through the deltoid and so exposed the scapular muscles, the long head of the triceps, and the scapular vessels and nerves. These last were quite out of the way, and, still feeling the dorsal branch with my finger, I passed a needle set on a handle, and armed with a ligature, round the vessels and adjacent cellular tissue, and tied a firm knot. There had been copious bleeding from many vessels when I removed my finger from the dorsal branch; but the moment that the ligature was tied this ceased, and the subsequent steps of the operation were almost bloodless. The base of the acromion was divided by bone forceps, and the neck of the glenoid cavity cut through with the saw. The tumour was then lifted up and separated from its attachments by cutting from without inwards. Three branches of the posterior scapular artery required ligature. The whole surface was washed with a weak solution of carbolic acid and the wound dressed with carbolic oil.

The subsequent history is shortly told. The wound was very soon converted into a superficial ulcer, and the ligatures came away without any hæmorrhage; but there was considerable tendency to falling down of the lower edge of the wound, and the man's health did not rally as might have been expected.

On December 6th he was advised to go home, for the sake of better and purer air. I heard afterwards that the wound healed up, and that for a short time he appeared to improve; but tubercular disease took place afterwards in the lungs, to which he ultimately succumbed. The tumour, as I supposed, was of a benign, osseous character.

The next case is that of C. A. M—, æt. 8, who was brought to the Hull Infirmary as an out-patient in April, 1871, under the care of my colleague, Dr. Elliott, on account of headache, loss of appetite and general debility. Finding that internal remedies produced no effect, Dr. Elliott carefully examined the child and observed a swelling over the region of the right scapula. This was said to have been caused by her having been knocked violently against a lamp-post eight months before, but it had not excited the particular attention of her parents, as it was not and had not been the seat of pain. The child was transferred to my care, and was admitted an in-patient of the Infirmary on May 24th, 1871. The tumour then caused a perceptible swelling over the whole scapular region most distinct above the spine, where it formed a considerable projection which on strong pressure yielded with a kind of crackling sensation. To satisfy any doubt an incision was made into this part of the tumour, when the finger seemed to pass into a bag of fragments of bone and soft curdy matter. A portion of the latter placed under the microscope was found to consist of large cells, containing many and large nuclei evidently of a malignant nature. The child's condition getting rapidly worse, excision of the entire scapula was recommended and agreed to by the parents. On the 17th June the following operation was performed:—An incision, as in the former case, was made along the whole length of the spine and acromion process, the scapular origin of the trapezius was divided, and the ligaments connecting the acromion and clavicle. The upper margin of the scapula was then drawn outwards, and the suprascapular artery divided and tied —all without the loss of two teaspoonfuls of blood. An incision was then made through the integument, from the middle of the lower lip of the first incision to the axillary margin, and the integument reflected; the origin of the deltoid was then divided, so as to expose the scapular muscles and long head of the triceps. A few scratches at the vertebral side of this muscle brought into view the dorsal vessels, and the armed needle was passed around them as



in the former case. Not a single vessel had spouted, and, feeling that there was no possibility now of any hæmorrhage of consequence, I opened the joint, got hold of the coracoid process and lifted up the scapula from its attachments, taking care to cut wide of the tumour and remove the bulk of the serratus magnus. Finding that the smallness of the opening in the skin impeded me, I made another incision from the spinal end of the first one along the vertebral edge of the scapula, and finished the operation by cutting through the muscular attachments of this border.

I pointed out to my colleagues and other medical friends who were present that not two tablespoonfuls of blood had been lost throughout the whole operation; indeed, no more than is common in an excision of the elbow or other ordinary operations of surgery.

Similar treatment was applied to the wound as in the case of R—, except that carbolic lotion only (not the oil) was used. The girl never had a bad symptom; the wound became from the time of the first dressing a superficial one; the ligatures (three in number) came away without any hæmorrhage. And on July 1st I find it noted in the hospital book that her health was improved, the appetite good, and the wound healing.

On August 11th she became an out-patient, having excellent power over the forearm and hand, being able to knit and feed herself and being fat and in the enjoyment of good general health. The wound was prevented from healing up entirely, by the projection of the clavicle, and I would have felt inclined in a similar case to have removed the outer portion of that bone.

In this operation hæmorrhage seems to me to be the only difficulty to be dreaded. Skey, speaking of a case in which he operated, says, "Had I undertaken the operation without ample assistance I have no doubt the man would have died on the table, so large was the bleeding from the vessels on each aspect of the bone." Syme says, that "wishing to command the subscapular artery I divided it, with the effect of giving issue to a fearful gush of blood, but fortunately caught the vessel and tied it without any delay."

Since the first of these two operations was performed Sir W.

Fergusson, in the last edition of his 'System of Practical Surgery,' strongly recommends "freeing and isolating the posterior and other margins before disarticulating, as much blood will thereby be saved." Lastly, in an article on "Excision of Bones and Joints," in his 'System of Surgery,' Mr. T. Holmes recommends that after the incisions through the integuments "the muscles inserted into the vertebral border of the bone should be rapidly divided, as also those which are attached to the spine of the scapula."—"The subscapular artery is divided near the end of the operation," and, he adds, that "in this way he has seen the scapula removed, with a very large and vascular tumour, without any serious bleeding."

Still, as the source of hæmorrhage must be the subscapular artery, I think the most reasonable course is to plan the operation so as remove this source of danger at the outset—neither to trust to able assistants, like Mr. Skey; to fortunately securing the vessel after a fearful gush, like Mr. Syme; nor to rapid strokes of the knife beginning at the remotest part—the vertebral border; but to begin by putting all risk of danger out of the question by securing the vessel at the internal border of the scapular head of triceps. This once done, there is no need for unusual assistance nor for haste. And these two cases show that the vessel can be readily secured at an early stage of the operation, and that once secured all danger from hæmorrhage is obviated.

I have seen this girl frequently since the wound healed, and have been surprised to notice what an excellent joint has been formed between the head of the humerus and the end of the clavicle. This result, I believe, more than counterbalances the trouble which the projection of the bone occasioned during the process of healing, and fully justifies the retention of the scapular end of the clavicle.

The accompanying plate, from a photograph taken two years after the operation, shows the articulation which has formed between the clavicle and the head of the humerus.

REMARKS ON FACIAL CARBUNCLE,

ESPECIALLY WHEN AFFECTING THE LIPS.

By CHAUNCY PUZEY,
SURGEON TO THE LIVERPOOL ROYAL INFIRMARY LOCK HOSPITAL.

Although it is traditional that the prognosis of carbuncle occurring about the head and neck is unfavorable, I find that comparatively little has been written (by English writers at least) on the subject of facial carbuncle or furuncle, a form of disease which seems to have been freely discussed in France (where by many it has been confounded with malignant pustule), but of which I find but few cases recorded by English surgeons.

I have therefore thought that some remarks on the principal features of this affection, its peculiar fatality, its diagnosis and treatment would probably be of interest to many.

I cannot lay claim to any original observations; for my paper is based upon information gleaned from medical publications, and from inquiries I made in consequence of having met with the following case:

On the 6th February this year I saw, with Mr. Warburton, of Edge Hill, Liverpool, a girl eight years of age, of whose illness I received the following account:

She had been in good health until a few days previously. On the night of January 31st she was restless, and complained of soreness and itching about the lower lip; the next day she was fretful and kept picking the lip, on which her mother noticed a small irritable spot which she supposed was the result of a scratch. Next day (2nd February) the lip became more inflamed and slightly swollen; and the child became feverish and ill. On the 5th Mr. Warburton was called in, and on the 6th I saw her.

Her condition was as follows:—Her lower lip was much swollen, dusky and everted, and near the left angle of the mouth presented a blackish and fissured patch about the size of a threepenny piece. The blackness appeared superficial, but the whole thickness of the lip was swollen and hard; and this induration extended over the chin; some distance over both cheeks, especially the left; below the jaw; and over a great part of the left submaxillary region. The skin was in some parts bright-red, and in others dusky-red, and shining. No fluctuation was felt in any part. The mouth could be opened sufficiently to allow of protrusion of the tongue, which was furred, but moist. There was no difficulty in swallowing. The pulse was 140; the temperature was not taken. The child lay in bed, and complained loudly, when moved, of pains in the knee and ankle-joints, which, however, did not present any appearance of inflammation. She suffered much from want of sleep.

I felt uncertain about the nature of the case; but it appeared to me that, although the mischief had arisen in the lip, it had now extended so far that nothing could be gained by incising the lip.

Poultices were ordered for the face; poppy fomentation for the joints; a calomel purge, and afterwards a mixture of chlorate of potash, hydrochloric acid and bark; small quantities of wine and beef-tea at frequent intervals, and hydrate of chloral at night; the mouth and lip to be frequently syringed with warm water. The next day matters appeared in *statu quo;* but on the 8th, the redness and induration had extended further up both cheeks, and over to the right submaxillary region; both eyes were closed, and here and there over the chin and cheeks were a few small pustules. The chin felt cold and looked mottled, the veins appearing as purple streaks. Pain in the left chest was also complained of, but no abnormal sounds were detected. The child had been very restless throughout the night, and her pulse was still 140.

It appeared imperative to relieve tension, and as there was no fluctuation perceptible in any part, and as the patient was a female whom I did not wish to disfigure, I made a free incision in the median line, in the submental region (whilst Mr. Warburton gave chloroform), taking time about it, and cutting until I felt that I had penetrated the hardened tissues.

There was not any troublesome hæmorrhage; the textures were brawny and almost like gristle. No pus was let out, but here and there, at the sides of the wound, little dots resembling pus could be distinguished. The poultices were re-applied. Next day the chin was warmer and less mottled; submaxillary region softer; eyelids less swollen. The poultice was merely stained with pus.

On the 10th, the child was evidently better; redness and induration much less; lip cleaner; left cheek more swollen, but softer; the pulse still continued over 130; appetite good; merely a trace of pus in the wound.

On the 13th, a scab had separated from the lip; an abscess was evidently forming in the left cheek. In the evening of this day, the child had an alarming attack of faintness: brandy was ordered in frequent doses, and ammonia, instead of chlorate of potash.

Next day (14th) the cheek was punctured and a large quantity of pus let out. On the 15th the pulse was much slower, and on the 16th below 100.

The swelling of the face was now rapidly disappearing, the lip nearly healed; but the child was excessively weak and emaciated, complaining of occasional pain in the chest, and in the knees, when moved.

A fortnight after, I saw her again, in consequence of her complaining of great pain if any attempt was made to straighten her knees, which were kept flexed at a considerable angle. After the free application of extract of belladonna and fomentations round the knees for some days, she commenced to move the joints satisfactorily. Cod-liver oil, iodide of iron and quinine were ordered, and she made a good recovery.

On the 24th August I saw the child again; she appeared well, except that she was troubled with a number of small boils about the shoulders and back. Her cheeks, chin and neck were rather disfigured by being deeply reddened in the manner frequently observed after a severe scald; the left angle of the mouth was a little puffy, and through the mucous membrane of that part of the lower lip small whitish dots were seen, presenting somewhat the appearance of a vaccination cicatrix.

Unfortunately the account of the early progress of the disease in the lip in this case cannot be clearly given, and when I saw it first, the appearance of the lip had been much altered by the child constantly picking it.

Mr. T. Smith, in the third volume of the 'Clinical Society's Transactions,' thus describes the disease:

"It usually begins in a small itchy pustule, boil or vesicle upon one of the lips. This in a day or two after its rupture is followed by a firm œdematous swelling of the lip, nose and cheek, producing a hideous deformity. A few pustules or vesicles show themselves about the red edge of the lip, and the swelling extends, the surrounding induration being less defined than in carbuncle elsewhere. The pain is generally most intense, and the colour of the surface usually passes through the shades of bright red, dusky red and dark plum colour, until it is almost black, particularly about the red edge of the lip. Suppuration is slow to occur, but, if the patient live long enough, pus will form."

In the same paper he gives a report of two illustrative cases, in both of which a pimple, which afterwards became pustular, formed on the lip; this was followed by extreme swelling of the face. In both a scab came away from the lip, followed by the escape of pus; the swelling increased; hurried respiration and other symptoms of pulmonary affection came on, with rapid pulse and profuse sweating. Death occurred in both cases on the eighth day.

In his essay on "Carbuncle" in 'Holmes's System,' the same author gives the details of a case which occurred in the practice of Sir J. Paget, of which the following is an abstract:

A young gentleman noticed a pimple on his upper lip; on the third day there was much swelling with constitutional disturbance. On the fifth day the whole of the left half of the upper lip and part of the cheek were occupied by indistinctly defined carbuncular swelling; the carbuncle was incised. On the seventh pus was coming from the wound, but the swelling had increased, with more constitutional symptoms; on the eighth day *there was protrusion of the eyeballs and chemosis of the conjunctiva.* After this, for two or three days the man was almost unconscious—then he rallied a little; but pustules formed on his eyelids, secondary abscesses showed themselves, and death ensued on the sixteenth day, having been preceded by pustular eruption on the abdomen and thighs, and by several abscesses.

"*During the last few days of his illness there had been noticed some fulness of the veins about the left eyelid, and induration about the lower part of the facial veins.*" The carbuncle was nearly healed.

Although my observations are principally confined to cases of disease affecting the lips, the following may fairly be mentioned as one of the same nature:

Dr. J. Chatterton, æt. 28, Coldstream Guards, died last autumn from the results of a small carbuncle in one nostril; one ala rapidly became swollen and indurated; the mischief soon involved the cheek. This was followed by great and painful swelling of the face—by rigors, pyæmia, and death on the eighth day. A post-mortem examination showed lobular pneumonia and pericarditis.

Mr. Reginald Harrison, Lecturer on Surgery at the Liverpool School of Medicine, has given me some notes of a case which he saw in consultation last year, and which probably was one of facial carbuncle, although the patient appears to have died before decided suppuration set in.

An office clerk, æt. 19, noticed a pimple at one angle of his mouth; the upper lip soon began to swell, and three days after, Mr. Harrison saw him. "The upper lip and one side of the face were much swollen. The swelling was tense, brawny, and of a purplish colour, and was proceeding to involve the side of the neck. There was no suppuration, and the skin presented, here and there, a peculiar tuberculated-looking appearance." The general condition indicated great prostration, with some cerebral disturbance. A free incision was made through some of the indurated textures; no pus was evacuated, but here and there, were small yellow-looking spots which appeared to be the *foci* of purulent deposits. Poultices, stimulants, and the ordinary remedies were prescribed; but no action took place in the wound, the general depression became more marked, and the patient died comatose on the eighth day after the pimple was first noticed.

M. Reverdin (to whose writings I shall refer again directly) says that he has noticed these yellow deposits in several cases.

He attributes them to a phlebitis or a periphlebitis of the venous radicles, set up by the carbuncle or furuncle, and considers them quite distinct from the "bourbillons" or cores which exist in the originating disease. In the case with which I commenced this paper, I noticed similar yellowish spots in the walls of the incision which I made under the jaw.

In the 'Gazette Hebdomadaire' (No. 46, November 13th, 1868) several cases are reported; and amongst them, one which shows how this peculiar affection may be overlooked. It is that of a young man, æt. 19, in whom immense swelling of the cheek, without any apparent cause, occurred. Passing over details, it is only necessary to say that, after presenting symptoms generally much resembling those which occurred in the cases I have just related, he died on the sixth day from pyæmia. On examining the interior of the mouth after death, carbuncular inflammation of the inner aspect of the cheek first affected was found, the mucous membrane being riddled with small holes, through which "bourbillons" could be squeezed.

In the 'Medical Times' for July 5th of this year, Dr. De Lisle, of Guernsey, relates the case of an actress who came under his care on May 25th, with a pimple on the upper lip; on the 27th he incised it and let out a few drops of pus; on the 31st the upper lip and left cheek were swollen and indurated, the left eye closed; pulse 140. Quinine, iron and strychnine was prescribed, with morphia and hydrate of chloral at night. On June 1st, crepitus was heard at the base of both lungs, and she was delirious; on the 2nd, the pulse was 170, the temperature 105; and on the 3rd June she died. No post-mortem was made.

The only case which I can remember at all resembling these was that of a man admitted into the Liverpool Royal Infirmary in March, 1867, under care of Mr. Bickersteth. His upper lip was nearly black; his nose and cheeks brawny, dusky red and immensely swollen. There were several pustules scattered about the upper lip and cheeks. Free incisions were made, poultices applied, stimulants and nourishment freely given; but the man became delirious, and died less than forty-eight hours after admission. He had been employed cleaning out cattle-trucks, and it was thought that he might have inoculated a scratch on his face with some poisonous matter. Unfortunately I have no notes of the case; but to the best of my recollection it answered exactly to the description of the disease given by the late Mr. Harvey Ludlow in his article on "Carbuncular Inflammation of the Lips," in the 'Medical Times' for 1852. In that and the two previous years there had been an epidemic of boils and carbuncles, a large number of which had been treated at St. Bartholomew's Hospital, and amongst others, there occurred several cases of carbuncular inflammation of the lips, three of which proved fatal.

At first it was thought by the surgeons of that hospital that the disease could be attributed to the absorption through an abrasion of the lip of some poisonous animal matter; but this theory was afterwards abandoned, the disease "in the majority of instances manifesting itself in patients whose occupation and pursuits rendered the contagion of a poison improbable."

The most exhaustive treatise I have found on the subject is by M. Reverdin (Interne Lauréat des Hôpitaux), who, in the "Archives de Médecine" for June, 1871, publishes a long account of his "Researches on the cause of the peculiar danger of anthrax and furuncle on the face."

He relates at full length the history of several cases which came under his personal observation, and he says that he has "collected notes of a very large number of cases of carbuncle and furuncle attacking the face, fifty-four of which had terminated fatally, and others, although ultimately followed by recovery, had put the lives of those attacked in such jeopardy as to arouse the greatest anxiety." He also gives the locality of the affection in forty-five cases which terminated fatally, as follows:

In the Lips	Upper	17
	Commissure	3
	Lower	9
	Nose (in 2 of these cases the upper lip also was involved)	5
	Temporo-parietal region	4
	Cheek	3
	Chin	1
	Angle of jaw	1
	Eyebrow	2
		45

The termination of the disease appears to bear no relation to its original size or extent, but depends on its situation; and this is due (as Reverdin states) to the facility with which the disease is complicated by phlebitis when it occurs in the facial region, *more* especially when the lips are involved; and, it appears to me, *most* especially when the upper lip is attacked.

He says, "When we dissect the skin which covers the chin, and remove it as far as the lip, we come, near the free border, to a region where it is impossible to separate the skin from the subjacent tissues without cutting muscular fibres which are united to the integument; fatty tissue is absent—we find only integument (either skin or mucous membrane), muscular fibres interlacing in every direction, numberless vessels, glands, and amongst these structures some fine filaments of connective tissue.

"When furuncle developes itself in the commissures or free borders of the lips, inflammation of the special nature which characterises this affection soon attacks the scanty quantity of connective tissue; pus forms in immediate contact with the blood-vessels; the muscle will not stretch; the fibres, blending with or firmly attached to the integument, confine the pus, which cannot therefore be expelled at the proper time; the venous radicles inflame, the inflammation extends to their trunks; the face swells.

"As to the lip, it is hard and tense, giving to the touch the sensation of a sausage, or even of a piece of wood; its colour is purple or blackish: this tension shows the resistance which the muscular tissues offer to the material formed in its fibres. If we make an early incision we find little yellow islets (or patches) scattered about everywhere in the muscle, which surrounds and confines them."

Thus we see how a small carbuncle or furuncle sets up in the lip, especially, a violent form of inflammation, and gives rise to phlebitis. This phlebitis in its turn sets up the enormous swelling of the face which, as far as I can ascertain, is almost always observed. But phlebitis once set up in the face is especially fatal, owing to the free communication between the facial vein and the ophthalmic vein (leading to the cavernous sinus) at the inner angle of the orbit, and with the internal jugular vein in the neck; also, probably, as Mr. T. Smith points out in his article on carbuncle in Holmes's 'System'), in consequence of the facial vein being less flaccid in its walls and more patent in its canal than other external veins. We see here also why the most fatal seat of this disease should be the *upper* lip. When this is attacked, the nose is soon involved; the veins from both these parts empty themselves into the facial vein at the root of the nose, and it is not surprising then that the ophthalmic vein should be soon involved. In fact, in looking through as many recorded cases as I can find, I learn that carbuncle of the upper lip, especially, has been speedily followed by the symptoms of implication of the cerebral sinuses. In the other cases of facial carbuncle death has sometimes supervened in the same manner, but frequently from general pyæmia.

M. Dubreuil, in the 'Gazette Hebdomadaire,' (1873, No. 47), relates the case of a wretched half-starved lad who came under his care with furuncle of the upper lip, in whom phlebitis occurred, and, no doubt, involved the ophthalmic vein. He opened several abscesses, amongst others, one in the orbit. Two months after, the patient was still alive, although in a very feeble condition. The ultimate result of this case is not given. In a similar case under his care, in which also exophthalmos existed, and which resulted in death, pus was found in both ophthalmic veins and in the anterior part of the cavernous sinuses, the posterior part of these sinuses being shut off by clot.

Mr. Long, consulting surgeon to the Liverpool Royal Infirmary, in a paper on pyæmia, read before the Medical Society of Liverpool, related the following case:—"In 1857, I saw, in consultation with Mr. Higginson, a boy aged seventeen years who was suffering from a carbuncle of the lip. It was opened and in a few days followed by the formation of matter behind the eyeballs and lids, causing them to protrude unnaturally; an incision was made through the conjunctiva; the matter being much diffused, none escaped. The case resulted fatally, and at a post-mortem examination pus was found on the membranes of the brain, in both pleuræ, the pericardium, and through the lung substance generally."

I might have quoted many more cases recorded by French surgeons, but I think I have brought forward a sufficient number to show the extreme liability to a fatal complication which exists in cases of facial carbuncle or furuncle, and the peculiar manner in which it is brought about. Of course many cases recover without any complication, but when once the œdema of the neighbouring part of the face has shown itself the prognosis must be grave; it shows that phlebitis has occurred in a region where phlebitis is always a serious matter. M. Reverdin has noticed that in some complicated cases a peripheral abscess (as he terms it) "has seemed to assist recovery;" probably it would be better to say "shows a tendency to recovery;" and he relates at length a case in which several small abscesses about the chin and below the jaw were opened by him. They occurred in the course of veins, and he distinctly made out obstruction of the anterior jugular vein. The patient recovered. I suppose that the abscess in the cheek of the girl whose case I have recorded was of the same nature. Such abscesses show the effect which nature or the patient's constitution is making to limit the blood-poisoning, and to prevent general pyæmia.

I propose now to say a few words on what appear to be the principal points to be observed in the diagnosis of this affection. My first impression, on seeing the case which I have recorded, was that it was one of charbon, and certainly there does appear to be a great similarity between the two affections. In fact, Dr. Budd, of Clifton, who contributed a series of papers (with illustrative cases) on "Malignant Pustule" to the 'British Medical Journal' for 1853, has insisted that the cases recorded by the late Mr. Harvey Ludlow are of the nature of charbon; and Billroth, in his 'Surgical Pathology,' includes both "charbon" and "facial carbuncle" under the term of "malignant pustule," and attributes them both to the inoculation of some poisonous animal matter.

But M. Reverdin says, "The presencc of 'cores' (*bourbillons*) and pus on the one hand, and the absence of the gangrenous spot with its areola of vesicles on the other hand, should be sufficient for a sure diagnosis." Mr. T. Smith, in his article before referred to, quotes M. Bourgeois in support of the diagnostic value of the presence or absence of pus. In all the cases recorded by Reverdin section showed either "cores" (*bourbillons*) or small deposits of pus infiltrated amongst the tissues in and about the seat of disease; in all the cases recorded by Mr. Ludlow pus was found either before or after death; but in Dr. Budd's cases, which appear to have been true "charbon," there was the black spot, the areola of vesicles, *and no trace of pus.* The swelling which occurs in charbon is merely the result of out-poured serum, perhaps mixed with the gas of decomposition; pus is never found infiltrated (Reverdin). Furthermore, the manner of death is different. The fatal cases of facial carbuncle or furuncle have succumbed either to phlebitis of the cerebral sinuses with its attendant lesions or to general pyæmia, whereas no appearance of such complications has been observed either ante- or post-mortem in those who have died of charbon, in which disease death results from rapid collapse, and after death the blood is found fluid and there is generally effusion of a little dark-coloured fluid into the serous cavities, and much congestion of the lungs, liver, and spleen. In facial carbuncle, death occurs in the same manner and with the same train of symptoms as when it follows carbuncle in other parts of the body.[*]

[*] To recapitulate.—

(*Malignant*) *facial carbuncle.*	*Charbon, or malignant pustule.*
Is not a specific disease.	Is the result of inoculation with an animal poison (generally through the bite of a fly).
Appears first as a pimple, which afterwards becomes pustular.	Appears as a pimple surmounted by a vesicle containing dark serum.
Contains "cores," which are discharged with pus, or are exposed by section of the part. The surrounding swelling is very painful.	Produces neither "cores" nor pus; but the central part of the sore becomes black, and is soon surrounded by a crop of vesicles, beneath which mortification extends. The slough is dry. The swelling is attended by little pain.
Results in death from phlebitis of the cerebral sinuses, or from general pyæmia, the various appearances of which are found on post-mortem examination.	Ends fatally in collapse, preceded by typhoid symptoms. After death the blood is found fluid; ecchymosis may be found in the intestinal mucous membrane, and there is a tendency to passive congestion and softening of the parenchymatous viscera. Decomposition is very rapid.

The question of diagnosis appears to be important. For although the general constitutional treatment should be the same in both diseases, *i. e.* the administration of nourishment, diffusible stimulants, tonics, especially quinine, yet the local treatment is different. In facial carbuncle, the non-fatal cases have for the most part been subjected to free incision of the originally diseased part, after which styptics may or may not be necessary to restrain bleeding (of course much hæmorrhage may be avoided by not cutting completely through the lip, thus avoiding the coronary arteries). In charbon, on the other hand, the only successful treatment has been to destroy thoroughly as soon as possible, with hot iron or caustic potash, the whole of the central eschar, with its surrounding areola of vesicles. In other words, to treat charbon as facial carbuncle would be useless; to treat facial carbuncle as charbon would probably be useless, and certainly would, in the event of the patient's recovery, cause an unnecessary amount of disfigurement. I am, of course, aware that the custom of freely incising carbuncles has given way to other modes of treatment, notably to pressure; but I do not see how such practice can be carried out when the lip is affected, and to my mind it appears pretty certain that, according to M. Reverdin's theory as to the course of this disease, an early incision must be the safest treatment. When once the general swelling of the face has taken place, we can only treat symptoms as they arise.

(The presence of Bacteria in the blood of patients affected by charbon has been noticed by some French surgeons, and it has been suggested that the raising of a small blister by the application of Liq. Ammoniæ, and examining the serum microscopically, might be practised as a means of early diagnosis.)

THE AFTER-TREATMENT OF LARGE AMPUTATIONS.

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The alterations in the treatment of large wounds which are from time to time suggested still leave room for further modifications, for we are far from having reached the most successful mode, or that which in its results gives unalloyed satisfaction.

The main feature of the present paper is the advocacy of the disuse of sutures, and the avoidance of all pressure in the shape of plasters and bandages in large lacerated wounds and primary amputations, where the skin and subjacent tissue have been much torn and contused, such, for instance, as a limb torn by machinery, where the bone has to be amputated some inches higher up, and there is skin to cover, but it is skin that has been much bruised and separated from its subjacent tissues, and consequently has its vascular supply greatly impaired; or, again, a secondary amputation, where the intermuscular spaces and the muscles themselves have become infiltrated with pus, and the patient has been reduced by profuse discharges and long confinement, and the amputation is resorted to as a *dernier ressort* to save the patient's life. In such cases the disuse of sutures would lead, not only to the formation of better stumps by avoiding sloughing or gangrene of any portion of skin, an occurrence so often resulting from the pressure put upon the skin by sutures when endeavouring to make the cut edges nicely approximate, but a far greater evil would be avoided—the grave constitutional effects, too often leading to a fatal issue, brought on by this same pressure of opposing sides, whose every vital action is thereby interfered with. When an attentive consideration is given to the state of a limb after a severe injury, such as a large lacerated wound with much destruction, and consequent loss of substance, it will be found that the muscular fibre, cellular and adipose tissue, capillaries lymphatic and vascular, whose continuity has been abruptly severed, do necessarily exude during the immediate succeeding days a large quantity of half-organized material or plasma, above and beyond what is required to preserve the vitality of the tissues that are left. This vital plasma cannot be regarded as an inert substance; on the contrary, under its altered condition of exposure to air and light, it degenerates into another and probably lower form of vitality, and it then ceases to be a beneficent agent in contact with unimpaired tissue, and becomes a positively deleterious one, whose contiguity is replete with danger—a danger that is increased when, by careful approximation of the broad cut surfaces, as in the case of an amputation, we close a large number of mouths, and in this way block up every vessel, every capillary out of whose divided end material not required ought to be allowed to escape. But the most careful approximation will not prevent a good deal of surplus material welling forth and remaining between the flaps, here quickly to lose its inert character and become an irritant, and very rapidly a focus from which degenerative action may radiate. Such seems to be the explanation of the appearances so often observed to begin about the second and third days after an amputation in a limb put up in the ordinary way, with sutures, plasters, and bandages, particularly if the limb has been much lacerated or its structure impaired with infiltrations of pus. For about that time the flaps present a turgid appearance, and if not an actual general redness, there are streaks of a darkish red hue running up the limb; there is a general sloughy appearance of the edges of the flaps, the latter also having a dusky look, which extends from half to two or more inches in breadth; this gradually darkens, and all the skin and subjacent tissue which has assumed this appearance, be it much or little, half the flap or only a small portion, dies, separates, and, coming away, leaves what before promised to be a well-covered stump, bare, with bone exposed.

This I believe to be entirely due to pressure put upon the flaps by sutures, plasters, pads, and bandages. It is even a question whether the fatal issue of an amputation within a day or two of the operation has not sometimes been brought about by the too careful closure of a large surface, whose structure may be in an unhealthy state, and its morbific material being thus forcibly retained, reacts upon the system. Certainly, when one sees a recent amputation, with its sutures imbedded deeply in the swollen skin, one cannot help feeling that to retain them there is fighting against nature, and can but lead to mischief of some sort, and we therefore let them go. But has not mischief already been done? And though we may remove the sutures in time to prevent gangrene of the strained skin, yet is it not probable that if we had left those edges free that there would have been no swelling at all, and if no swelling or engorgement then no throwing back upon the system of that surplus material which has been sent down, and so no alarming constitutional derangement?

The plan of treating large wounds at present adopted by those who keep in advance in the field of surgery is probably either that of Lister or Callender. The first is founded on the doctrine that no pus in excess need be formed, and since the plan has been introduced numerous striking instances of compound fracture treated on this principle have been related where there has been such rapid union of injured tissue, with so little expenditure of material in the form of increased secretion of any sort, as to justify the wonderful hold this mode of dressing has taken upon the minds of hospital surgeons. I would be most unwilling to detract from its value, simply maintaining that there are a certain class of cases, namely, those specified above, where it is powerless to prevent a large amount of new formative material being secreted, and that the attempt in such cases to carry out the plan, as it necessitates the close adaptation of parts, leads often to the sloughing of skin within the first few days by the undue strain put upon it, or to abscesses in the neighbourhood later on.

The most successful cases under Lister's method are compound fractures not needing amputation, abscesses, and small lacerated wounds. When we come to deal with a limb, one half of which has been removed, the *status quo* is different, a fact too generally lost sight of. Here it is quite conceivable that we have often interfered injudiciously with nature's method of adapting supply to demand, and with her disposal of the surplus at first left on her hands, when we so carefully seal up the ends of a stump. She cannot at once contract the calibre of the supplying vessels, reduce the expenditure of force to the required amount, and diminish the supply to be transmitted to the mutilated limb. On the contrary, there is increase of action at first.

Mr. Callender's method, as representing, probably, the most perfect plan of those who do not believe in the power and influence of atmospheric germs, may be briefly summarised as follows:—The use of torsion rather than of ligatures to arrest hæmorrhage; the washing of the wound after all bleeding has been most carefully stopped with carbolic lotion; the bringing together of the flaps or sides of the wound with silver sutures; the fitting in of a drainage tube of improved construction, to secure for the first twenty-four hours the removal of all fluids, after which it is withdrawn; and, finally, in the after-treatment, the use of cotton wool as a first dressing, rest, isolation, and great attention to cleanliness—special means being adopted for attaining these ends.

To this plan of treatment it would be impossible to take exception save in two points—the use of sutures, and the substitution of torsion for ligatures. To speak of the latter first. In the hands of most surgeons, I think I shall not be wrong in saying, this method of arresting hæmorrhage from the larger vessels has often failed, and even where it has not, has been accompanied with a feeling of uncertainty, which is likely to prevent its ever coming into general use. There is the less necessity for adopting it now that the old form of ligaturing, and leaving one or both of the long ends dangling out of the wound, has been pretty well discarded, and ligatures either of carbolized catgut or silk, with ends cut quite short, substituted. These, as they come away in a day or two, are no source of irritation, and convey a feeling of security to the operator's mind, which the practice of torsion does not. It is a mistake to use so many ligatures; I have seldom, even in the larger amputations, had to apply more than three; for the smaller arteries, torsion and the application of ice have never failed to arrest hæmorrhage. The subsequent washing of the wound with carbolic lotion blanches the surface completely.

The other point, that of bringing the flaps in all cases together with sutures, I object to for the reasons given in the first part of this paper. It was only after having met with a considerable number of instances where gangrene of a portion of the skin and subjacent tissue of the flaps and of others where grave constitutional disturbance had followed, which could be explained in no other way, that I came to the conclusion that these results were due to the pressure put upon the congested and contused flaps by the sutures. Where sutures are not used there is no occasion to introduce a drainage tube, as there is nothing to prevent the free escape of all fluids, and thus an objectionable foreign body, harmless though it may seem to be, is dispensed with.

In conclusion, a short account of four of the most recent cases treated on the plan advocated will serve to show, not only the success attending it, but the mode of carrying it out.

Case 1.—John E—, æt. 47, admitted into the Royal Southern Hospital on July 12th, 1873, with compound fracture of femur opening into the knee-joint, two scalp wounds, fracture of frontal bone, and fracture of left arm; fell from a ship's bow to the quay, about thirty feet. An attempt was made to save the leg, and for a long time he seemed to go on well, and it was hoped anchylosis of the knee-joint was steadily progressing; but early in September he began to fall off; large abscesses formed on the thigh; a great part of the outer condyle of femur was felt to be bare; he rapidly lost flesh; a bed-sore formed over the coccyx, and in October his state became very precarious. All hope of saving the limb was abandoned; it was even doubtful if amputation would save his life; he had sunk into such a state of blood-poisoning that a sickly, offensive odour emanated from him, and consecutive abscesses in other parts began to appear. As he was willing to submit to the operation, it was thought right to give him the chance, and on October the 16th the thigh was removed about five inches above the knee-joint. The whole of the soft parts were found infiltrated with pus, and a portion of the femur above the fracture was found bare of periosteum. The flaps, which were of about equal length, were pale and bloodless, and pus oozed out from every part of them. He lost a moderate amount of blood, chiefly venous; three arteries were tied, and the ligatures cut short. The surfaces were well washed with carbolic lotion.

The flaps were not brought together, but the under flap was supported on a pillow with a good layer of cotton wool to rest upon; a covering of the same surrounded the upper flap, and thus the whole stump was imbedded in cotton wool without other dressing. He was very collapsed during the operation; it was even doubtful once or twice whether he would rally, the heart's action every now and then became so feeble. It was some hours before he could be removed from the table. In the course of the evening he became conscious, and was removed to bed, but it was not until the next day that he could speak. Fresh cotton wool was applied every day. The progress of the case need not be told in detail; it was steadily satisfactory, a free discharge of pus continuing from the first. The flaps drew together of themselves, well covering the bone. There was one circumstance which sufficiently showed the ill effects of pressure. On the tenth day I was induced to put three straps of plaster to hold up the lower flap, and facilitate the adhesion between the two. Within a few hours he complained of feverishness, loss of appetite, and not feeling so well; and the day but one after, when I again saw him, a blush of redness was noticed all round the thigh, and the latter had a full, swollen appearance. I removed the plaster at once, relying on the cotton wool alone, and in a few hours these symptoms subsided and he made a good recovery.

Case 2.—James M—, æt. 25, admitted October 4th; compound fracture of right thigh. He had slipped and fallen under the wheels of a moving railway waggon, by which the foot, leg, and lower part of the thigh had been crushed, and merely remained attached by pieces of muscle and skin. He was greatly collapsed, having lost much blood, and without moving him from the trolly on which he lay, partly on his face, I amputated the thigh a few inches higher up, first securing the artery, and then trimmed the jagged ends of flaps, without removing more of the skin and soft parts than were actually in shreds. Thus a good deal of bruised tissue was left with which to cover the end of the bone. One or two ligatures were applied, and then after a good washing with carbolic lotion the stump was enveloped in cotton wool and comfortably arranged on a pillow. For some hours he lay in a partially unconscious state, after which he slowly rallied.

The cotton wool was daily removed, and fresh applied. There is a little difficulty in doing this, as after the first dressing it is apt to stick in the wound, but with a little care it can be picked off. To prevent decomposition, the outside of the wool was sprinkled with Calvert's carbolic powder. This case did well: none of the bruised skin died, and at the end of six weeks he left the hospital with a stump well covered both by muscle and skin.

Case 3.—Josiah W—, æt. 17, admitted October 21st. Had all the fingers and the thumb of right hand mangled by a circular saw. The skin on the dorsum of the hand was greatly lacerated, much of it having disappeared altogether; the thumb was gone, and the ends of all the metacarpal bones were fractured. The fingers themselves were mere pulps, only the skin on the palmar aspect of the third and fourth being intact. I removed all loose pieces of bone, also the ends of the metacarpal bones, but preserved the skin of the two fingers mentioned, this being the only skin left to cover a portion of the stump, two thirds having no covering but muscle. These two long strips were brought round and laid upon the dorsal aspect as far as they would reach, but no attempt was made to fix them there. The hand was laid upon a splint, and covered with cotton wool. There was no subsequent loss of tissue, not a particle of skin sloughed. After a few days the carbolic oil on lint was substituted for cotton wool, because the latter, adhering to the raw surface, became troublesome to remove. He has recovered, retaining a hand, certainly without fingers or thumb, but which I have good hopes will prove more useful than none at all. Formerly we should have amputated in such a case at the wrist-joint.

Case 4.—Mary M—, æt. 8, admitted October 5th, 1873. Run over by tramway-omnibus, both arms being torn off, the one close to the shoulder-joint, the other a few inches lower down. The soft parts were much torn and bruised, so that in the amputations which I performed in about two hours after only about three inches of the humerus could be left on the one side, and the head of the bone merely on the other; there was then scarcely sufficient skin left to cover them. It was fully expected that the child could not survive such an injury many hours; the stumps were covered with the cotton wool, and she was placed in a cot. She slowly rallied, soon began to take food, and steadily progressed, making a good recovery. The stumps were dressed daily with cotton wool, the skin gradually closing over them. This poor little cripple, whom we almost wished would die, recovered without an untoward symptom.

In her case, as in the others, with the slight exception mentioned in Case 1, there was no interruption to the steady progress from the first towards convalescence.

Finally, the length of time occupied in the process of cure was not greater in these cases than in those where sutures were formerly used.

NOTES ON SYPHILIS.

By S. MESSENGER BRADLEY, F.R.C.S.

Subcutaneous Injection of Mercury in Constitutional Syphilis.

During the last year I have employed mercury subcutaneously in twenty-one cases of constitutional syphilis, all of which were carefully watched; I have not, however, met with results which much incline me to give this treatment a further trial. The preparations employed were the perchloride and bycyanide of mercury; the doses ranged from $\frac{1}{20}$th to $\frac{1}{10}$th of a grain, and the injections were administered, always under my own observation, two, three, and six times a week.

The cases selected afforded good tests of the value of the remedy. All were cases of constitutional syphilis which had not been treated with mercury either for the initial lesion or the constitutional affection. The nature of the secondary affection varied widely; in some ulceration of the soft palate was the only symptom, in others there were nodes, in others squamous or papular syphilides, in others rupia or gummata of the tongue.

Briefly to summarise my results, I found that the only cases which derived marked benefit were the cases of cutaneous affections, particularly when these were the milder forms of psoriasis or roseola; in three instances the syphilide disappeared very quickly from the skin, but in one case the patient presented himself at the hospital six weeks afterwards with a recurrence of the psoriasis.

The cases in which the mucous membranes were affected did not in a single instance derive perceptible benefit, and in all recourse was eventually made to other modes of treatment.

Nearly all the patients complained of more or less pain or inconvenience from the injections. In some the pain was quite trifling, and the subsequent inconvenience slight. In several there was an unpleasant tingling or numbness of the arm experienced at the time, which was followed by long continued, and generally painful, indurations of the cellular tissue. In two cases the injections were followed by abscesses, and in one of these, a case of psoriasis with throat affections, in a pale young man of about twenty-five, phlegmonous erysipelas ensued with such extensive sloughing of the cellular tissue of the arm that for a time the life of the patient was in jeopardy.

Three patients failed to present themselves after the first or second administration of the injection, and so were altogether lost sight of.

None of the cases of tertiary syphilis, by which I mean the cases of rupia and gummata, were even relieved by the treatment, although in all the mercurial belt was subsequently worn with advantage.

Thus tabulating the twenty-one cases we have the following results:

No. of cases.	Nature of syphilitic affection.	Form and dose of mercury administered in fractions of a grain.	No. of injections.	Results.
1	Extensive facial rupia	Hyd. Bicy. $\frac{1}{16}$	8	No improvement.
2	Gummata of tongue, with tubercular syphilides	Hyd. Bicy. $\frac{1}{16}$	10	No improvement.
3	Rupia, with ulceration of leg	Hyd. Bicy. $\frac{1}{20}$	10	Increase of both during treatment.
4	Psoriasis, extensive	Hyd. Perch. $\frac{1}{16}$	12	Disappearance of psoriasis; recurrence in 6 weeks.
5	Sec. laryngitis, tubercular syphilide	Hyd. Perch. $\frac{1}{12}$	12	No improvement.
6	Roseola	Hyd. Perch. $\frac{1}{10}$	6	Disappearance in 10 days.
7	Psoriasis	Hyd. Bicy. $\frac{1}{10}$	8	Disappearance in 14 days.
8	Syphilitic psoriasis of tongue	Hyd. Bicy. $\frac{1}{10}$	14	No change.
9	Syphilitic papules of scalp	Hyd. Bicy. $\frac{1}{10}$	1	Patient failed to return.
10	Psoriasis with throat affection	Hyd. Bicy. $\frac{1}{16}$	2	Patient failed to return.
11	Painful post.-cervical adenopathy; fissures of tongue	Hyd. Perch. $\frac{1}{16}$	2	Patient failed to return.
12	Nodes on tibia; syphilitic maculæ	Hyd. Perch. $\frac{1}{12}$	20	Slight decrease in the periostitis.
13	Nodes on tibia; syphilitic ulceration of leg	Hyd. Bicy. $\frac{1}{12}$	28	No improvement.

No. of cases.	Nature of syphilitic affection.	Form and dose of mercury administered in fractions of a grain.	No. of injections.	Results.
14	Ulceration of soft palate .	Hyd. Bicy. $\frac{1}{10}$	6	Increase of ulceration during treatment.
15	Ulceration of soft palate; roseola	Hyd. Bicy. $\frac{1}{10}$	14	No improvement.
16	Ulceration of soft palate, &c.	Hyd. Bicy. $\frac{1}{10}$	16	No improvement.
17	Ulceration of soft palate, &c.	Hyd. Perch. $\frac{1}{16}$	6	No improvement.
18	Ulceration of soft palate; impetigo . . .	Hyd. Bicy. $\frac{1}{12}$	18	No improvement.
19	Ulceration of soft palate; roseola	Hyd. Perch. $\frac{1}{16}$	8	Considerable improvement in roseola.
20	Ulceration of soft palate (rapidly extending) .	Hyd. Bicy. $\frac{1}{10}$	6	Increase during treatment.
21	Ulceration of soft palate .	Hyd. Bicy. $\frac{1}{12}$	10	No improvement.

These are not brilliant results, and yet I venture to affirm that they afford a fair criterion of the value of this mode of treatment. Let us consider sequentially the advantages claimed for this plan by its advocates. They are cleanliness, speediness of cure, small quantity of mercury employed, avoidance of irritating effects of mercury, and the exact adjustment and measurement of dose.

Cleanliness.—There is not a word to be said against this claim; whatever value it possesses is justly its due, although it is by no means clear why it is cleaner than the internal administration of mercury or even treatment by the bath.

Speediness of cure.—My own experience does not warrant me in subscribing to this claim, even though *cure* be translated "disappearance of the existing syphilide." The great majority of my cases derived no perceptible benefit from the treatment, which, on an average, lasted three weeks. Nor is it very certain that the rapid disappearance of a syphilide is a matter greatly to be desired; *longo morbo, longum remedium* seems particularly true in the treatment of syphilis; experience goes to prove that the cases which are really cured are those in which a very gentle action of mercury has been kept up for a very long time, *i. e.* from four to six months, so that, paradoxical as it may sound, this very rapidity of the apparent cure is perhaps an evil. Of course there are cases of constitutional syphilis in which it is very desirable to produce a speedy effect; this is especially true in cases of syphilitic iritis;

in these cases, however, the frequent and considerable inunction of mercury will most frequently answer every hope, but if this or the internal administration of mercury should fail, in such cases, by all means, trial should be made of the method of subcutaneous injection. In fact, I am of opinion that it is in these cases, and in these cases only, that the method will live.

Small quantity of mercury employed.—This is purely hypothetical. It is quite as likely that in inunction, fumigation, or the internal administration of mercury, only a very small portion, an equally small portion with the quantity introduced beneath the skin, is actually absorbed. In the subcutaneous injection the entire dose rapidly finds its way into the system, when it produces its full effects, but it is certain that in none of the other modes is this the case. This uncertainty as to the exact quantity which will be absorbed in fumigation or inunction is, so far as it goes, an objection, but practically it is more apparent than real. We find in actual practice that we are easily able to regulate the exact effect we want to produce upon the gums and system generally, either by the baths or by inunction.

The homœopaths employ a preparation which they term *mercurius dulcis No.* 1, which consists of calomel and finely levigated sugar of milk in the proportion of one per cent. of the mercurial. I have for some years given this preparation from time to time, and have frequently produced violent purgation with a five-grain dose, which is equal to $\frac{1}{20}$th of a grain of calomel. From this it seems probable that when we give large doses of mercury only a small portion is actually absorbed, the greater quantity passing off by the bowels.

Avoidance of irritating effects of mercury.—This is not always correct. In one case in which I employed this method diarrhœa followed as a consequence, ceasing on the cessation of the remedy. Whatever truth, however, there be in this plea is quite equally true of the two other methods of treatment before alluded to.

Exact adjustment and measurement of dose.—This is quite a point in favour of this mode, and if its other claims were as good would unquestionably establish it on firm grounds. For no other treatment can this be claimed, and it is very interesting to notice how very small a quantity of mercury is in some cases sufficient to effect a cure. For example, in none of my cases in which benefit was derived was there more than $2\frac{1}{2}$ grs. of mercury administered, and in one case (No. 6) cure apparently followed the exhibition of $\frac{3}{5}$ths of a grain of the perchloride.

Having now glanced at the advantages claimed for this treatment let us briefly review its disadvantages. They seem to be: probable loss of patients, pain caused by the injections, the occurrence of abscesses or of phlegmonous erysipelas, and the chance of a fatal case.

Probable loss of patients.—When patients are boxed up in a hospital this objection of course does not hold, but when "men may go and men may come," when they are free as private or even out-patients of a hospital are free, then there is much probability in many of them declining to return for the administration of the injection. In three of my hospital cases this actually occurred, and in private practice this must always operate as a real objection.

Pain caused by the injections. — Frequently this is trifling enough, but is never quite absent, and in some cases is really severe. When other modes are absolutely painless this is in itself a positive disadvantage, though by no means the principal one to be alleged against this mode of treatment. The pain at the time wears off in something like an hour, but is very frequently followed by indurations of the cellular tissue, which may, it is true, themselves be painless, but which, on the other hand, may be followed by abscesses, which is the next objection to be urged against this mode of treatment.

The occurrence of abscesses.—In two out of the twenty-one cases in which I employed subcutaneous injections abscesses followed. This I fancy is about the proportion in which they will be found to occur, that is, in ten per cent. of the total number of cases. Although I am aware that some advocates of the plan have met with more fortunate results, I am inclined to believe that this is due to limiting the adoption of the treatment to cases in which the syphilides are very recent and the system little vitiated by the poison. In both the instances I record the abscesses were accompanied with severe pain, and in one case were followed by an attack of phlegmonous erysipelas.

Phlegmonous erysipelas.—This constitutes a real danger. In the case I record there was nothing in the appearance, age, or previous history of the case to lead one to suppose that he was prone to erysipelatous affections. The cellulitis, however, which ensued was severe, was followed by considerable sloughing, and for a time the life of the man was in peril. This leads me to consider the last objection to this plan of treatment.

The chance of directly causing death.—When we remember the cachectic condition which syphilis itself tends to produce in the system, and the local irritation to which mercury is prone to give rise, we cannot wonder at the occasional occurrence of phlegmonous erysipelas, and it must be admitted that in no case is phlegmonous erysipelas unattended with direct danger to life. It is consequently almost certain that if this mode of treatment were to meet with general adoption a fatal case would by-and-by occur, which seems to me to constitute a very grave, indeed, insuperable objection to its acceptance. When we reflect how absolutely safe and eminently successful are the ordinary methods of treating syphilis, it is a necessary moral sequence that a single death directly attributable to the treatment must be fully and finally fatal to any scheme which cannot boast immense advantages over those already in practice.

In fine, as I stated at the commencement of this note, I am so well satisfied with other modes of treatment, notably the mercurial bath for private patients and the plan of inunction and the mercurial belt for hospital cases, that I do not see anything to be gained in the adoption of the treatment by subcutaneous injection.

ON CERTAIN IMPROVEMENTS IN THE HINGED SHORT FORCEPS.*

BY FRANCIS VACHER.

In my paper descriptive of, and remarking upon, a new form of midwifery forceps, issued last year, I stated that though convinced the principle on which my instrument was constructed was sound, I could not pronounce it a perfect short forceps. Indeed, in the course of the first delivery it accomplished, one defect, viz. the position of the button commanding the steel snap, became apparent, and since then two other flaws in the original design have discovered themselves, one, the instrument's extreme shortness, and the other, its want of some modification which would enable the operator to unlock and withdraw the blades without previously returning them into the hollow of the sacrum. These three imperfections I have, with the kind assistance of Messrs. Weiss and Son, whom I personally consulted on the subject, been enabled to correct. In what manner will be seen at a glance by comparing the accompanying cut with the illustration to my former paper.

In the first place the catch which locks the blades when *in sitû* is controlled from the end of the half of the handle attached to the upper or outer blade instead of from the front of the half of the handle belonging to the lower blade, so that with the new instrument there is no possibility of an operator involuntarily unlocking it by the pressure of the palm of his hand during traction.

Secondly, inasmuch as this forceps is intended for effecting delivery of the head when in the pelvic cavity, no less than when it has in great part passed through the outlet, I have found it necessary to increase its length by removing the clamps a little further from the handle by the introduction of strong shanks an inch and a quarter in length.

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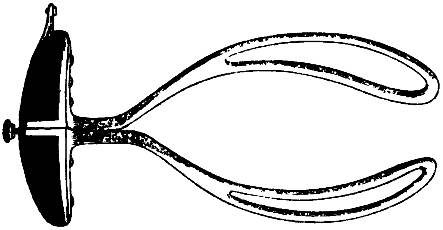
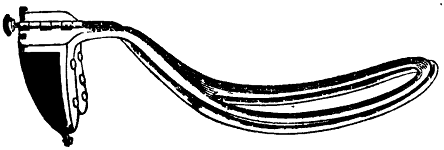
* An Appendix to "Remarks on a New Midwifery Forceps." 'Liverpool and Manchester Medical and Surgical Reports,' 1873.

Thirdly, it having been pointed out to me that should delivery prove impracticable after traction had been sufficiently long tried it would be an advantage to be able to separate the blades, and remove them right and left in the ordinary way, I have had the hinge rivet fitted with a head to allow of its being readily drawn.





It will be observed also that the black wood handle previously figured chequered now appears plain, as I intended it should be in the first instance, having found by experience how very troublesome it is to keep clean handles of any instruments mounted in chequered wood.

I have only to add that the hinged forceps, as now re-submitted to the notice of the profession, while obviously more useful than the pattern at first planned, is so little increased in size and weight that it is still, I believe, the smallest, lightest, and most portable short forceps devised.

FIVE YEARS' SURGICAL WORK
IN THE
MANCHESTER ROYAL INFIRMARY.

By EDWARD LUND, F.R.C.S.,
ONE OF THE SURGEONS TO THE HOSPITAL, AND MEMBER OF THE SENATE OF THE OWEN'S COLLEGE, MANCHESTER.

In publishing the following details of five years' surgical experience in the Manchester Royal Infirmary I have two objects in view,—the one to show in what such practice consists and the extent of it; the other to illustrate in a practical manner the advantages to be gained by attention to that method of reporting surgical cases in hospital practice which I described more fully in the last volume of the 'Liverpool and Manchester Medical Reports.'

It may almost be regarded as the bounden duty of a hospital surgeon, who is indebted for his public position to the sanction and support of his professional brethren, to lay before them, at stated periods, some account of his stewardship, and to show what has been gained, from time to time, in the larger field of experience which he possesses, and thus to give back to his fellow-workers in scientific research any new facts he may have noted, or any improved methods of surgical treatment. In the plan here followed for registering the reports, I have kept an exact record, with my own hand, of every case treated by me in our surgical wards during the five years ending December, 1871, and in carrying out this self-imposed task, which I undertook on my appointment as one of the acting surgeons of the hospital, I have been greatly aided by the courteous assistance of those gentlemen who filled the office of senior house-surgeon in succession each year during that time; and with great pleasure I mention the well-known names of Messrs. Woodcock, Fennel, Pinder, Boutflower, and Carruthers, who can each bear testimony to the general accuracy in detail of these reports, as they remember how they looked on patiently while I noted with unbroken regularity from day to day, in my peregrinations through the wards, the special points of interest in each case—a process which might seem to them needlessly minute. In this quinquennial period, from January, 1867, to December, 1871, 1309 surgical cases were admitted under my care in the wards of our hospital, 977 of whom were males and 332 females, and amongst which 75 deaths occurred. Of course a certain proportion of the cases were acute in their nature and were truly accidental, the others coming under the category of surgical disease. In attempting to estimate, from these reports, the average number of in-patients of the entire hospital, it must be borne in mind that the numbers here quoted, so far as they refer to cases of accident or emergency, if multiplied by six would give very closely the total average number in the hospital attended by the surgical staff, but, in surgical disease, and in cases of great importance, where the time for admission is not urgent, a much larger proportion have without doubt fallen to the share of my colleagues,—men who are my seniors in office, and who, by reason of their greater repute and greater experience, would be more likely to be selected by the friends of patients, so admitted, as the operators in important cases. Hence it is that, in this record of my surgical cases, a very small proportion of the larger operations in surgery will be noted, as compared with those of more general or ordinary occurrence. I cannot attempt to describe in detail all the cases contained in these reports, or even a tithe of them, but I will indicate as I deal with each class in succession and each subclass and division those cases which have been of the greatest interest, or to which the greatest amount of practical or scientific importance can be attached. As to the various causes of the different accidents which I have herein reported I have made special inquiries to ascertain how far, in the ordinary course of things, a certain proportion of them might be accounted as avoidable or preventible. In the workshops and factories of our city the authorised Government inspectors are sufficiently active in their duties to detect, and as quickly to correct, any general failure of precautions in such matters, but there is a cause of frequent disablement amongst the working classes, namely, drunkenness, which is in truth a preventible source of injury, and which these records show has had its usual influence upon the returns; in contusions and sometimes fractures; in burns and scalds; and, as the climax of all, in the perpetration of suicidal wounds. The excitement of drink, or perhaps the insufferable depression and the wretched melancholy which follow in its train, have determined the loss of health, of limb, and even of life. The tale thus simply told in these records must point its own moral. In some of the tables, such as those for burns and scalds, I have indicated those special statistics by a particular arrangement of the enumerating figures. Thus, for each period or epoch of life there are two columns reading from left to right, males and females. Then each of these has cut off from it by the lines of the text a square space, in the four corners of which when needful four numerals are placed, commencing with the left upper corner, where the number and cause of the injury at that particular age is placed, and on the right the deaths. Below, at the left-hand corner, the number of cases in which, at the time of receiving the injury, the patient was under the influence of drink, but yet recovered; and opposite to it, in the right-hand bottom corner, we read the deaths which may have occurred under the double influence of poison by alcohol, and the chances of the accident. At first in making up these returns I felt inclined to go on the good old principle *de mortuis nil nisi bonum*, and to class these latter individuals simply with the deaths, but it has occurred to me that as no personal reference is made to the victims of this vice a distinction might serve to show, on public grounds, how bad habits, which at first seem innocent or inoffensive, may yet become a mighty cause of misery and death. Fortunately, in my records such cases as these are few and far between.

The following list, which will serve as an index to the subject matter of this paper, shows how I have classified the cases by arranging them under eight chief classes, dividing these, according to circumstances, into sub-classes, divisions, and sub-divisions, as seemed needful.

CLASS I.

A.	CONTUSIONS.	142
	a. Head.	
	b. Face.	
	c. Chest and Back.	
	d. Abdomen and Pelvis.	
	e. Hip and Lower Limbs.	
	f. Shoulder and Upper Limbs.	
B.	WOUNDS.	122
	a. Contused.	
	b. Lacerated.	
	c. Punctured.	
	d. Incised.	
	e. Gunshot.	
	f. Scalds and Burns.	
	1. Scalds.	25
	2. Burns.	42
C.	AMPUTATIONS.	61
	a. Accident.	
	b. Disease.	
D.	ULCERS.	82
	a. Simple.	
	b. Indolent.	
	c. Varicose.	
	d. Eczematous.	
	e. Syphilitic.	
	f. Epithelial.	

CLASS II.

A.	HERNIÆ.	25
	a. Umbilical.	
	b. Inguinal.	
	c. Femoral.	

B. Tumours. 21

- *a.* Fatty.
- *b.* Fibrous.
- *c.* Cystic.
- *d.* Glandular.
- *e.* Myeloid.
- *f.* Malignant.

C. Abscesses. 40

- *a.* Head, Neck, or Chest.
- *b.* Shoulder.
- *c.* Arm.
- *d.* Forearm.
- *e.* Hand.
- *f.* Lumbar.
- *g.* Psoas-iliac.
- *h.* Pelvic and Inguinal.
- *i.* Buttock and Hip.
- *k.* Thigh.
- *l.* Leg.
- *m.* Foot.

CLASS III.

A. Diseases of Bone. 56

- *a.* Caries and necrosis.
    1. Cranium.
    2. Face.
    3. Scapula.
    4. Humerus.
    5. Ulna.
    6. Radius.
    7. Hand.
    8. Vertebræ.
    9. Femur.
    10. Tibia.
    11. Fibula.
    12. Foot.

B. Diseases of Joints. 70
- *a.* Sterno-chondral.
- *b.* Elbow.
- *c.* Wrist.
- *d.* Hip.
- *e.* Knee.
- *f.* Ankle.
- *g.* Foot.

C. Excision of Joints. 8
- *a.* Elbow.
- *b.* Knee.
- *c.* Astragalus.

D. Sprains near Joints. 25
- *a.* Wrist.
- *b.* Knee.
- *c.* Ankle and Foot.

E. Inflamed Tendons and Thecæ. 7
- *a.* Wrist and Hand.
- *b.* Knee.
- *c.* Ankle and Foot.

F. Bursæ near Joints. 9
- *a.* Elbow.
- *b.* Knee.
- *c.* Ankle and Foot.

G. Loose Cartilages. 1
- *a.* Knee-joint.

H. Talipes. 2
- *a.* T. varus.

CLASS IV.

A. Dislocations. 5
- *a.* Shoulder.
- *b.* Elbow.
- *c.* Hip.

B. Fractures. 304

- *a.* Simple.
  - 1. Face.
  - 2. Clavicle.
  - 3. Humerus.
  - 4. Ulna.
  - 5. Radius.
  - 6. Ulna and Radius.
  - 7. Hand.
  - 8. Ribs.
  - 9. Pelvis.
  - 10. Femur.
  - 11. Patella.
  - 12. Tibia.
  - 13. Fibula.
  - 14. Tibia and Fibula.
  - 15. Foot.
- *b.* Compound.
  - 1. Face.
  - 2. Humerus.
  - 3. Femur.
  - 4. Tibia and Fibula.

CLASS V.

A. Arteries. 15

- *a.* Wounds.
- *b.* Atheroma.
- *c.* Aneurisms.
- *d.* Ligature of Femoral.
- *e.* Ligature of External Iliac.

B. Veins. 2

- *a.* Varicose, ligatured.
- *b.* Varicocele, ligatured.

CLASS VI.

A. Brain. 34

- *a.* Concussion.

- *b.* Epileptic Fits.
- *c.* Fracture of Skull.

B. Spinal Cord. 20

- *a.* Concussion.
- *b.* Paralysis.
- *c.* Fracture of Vertebræ.
- *d.* Diseased Vertebræ.
- *e.* Tetanus.
- *f.* Neuralgia and Neuromata.
- *g.* Infantile Paralysis.

CLASS VII.

A. Bladder. 35

- *a.* Irritable.
- *b.* Cystitis.
- *c.* Prostate.
- *d.* Lithotomy.
- *e.* Lithotomy for Foreign Body
- *f.* Hæmaturia.
- *g.* Vesical Fistula.

B. Urethra. 28

- *a.* Laceration of.
- *b.* Calculus in.
- *c.* Stricture, Traumatic.
- *d.* Stricture, Organic.
- *e.* Holt's Operation.
- *f.* Syme's Section.

C. Penis and Scrotum. 11

- *a.* Phymosis Operation.
- *b.* Paraphymosis.
- *c.* Syphilitic Ulceration.

D. Testis. 10

- *a.* Orchitis.
- *b.* Epididymitis.

c. Hydrocele.
d. Hydrocele, Radical cure.
e. Castration.

E. BREAST. 22
a. Abscess.
b. Recurrent Fibroid Tumour.
c. Scirrhus.
d. Carcinoma.

F. OVARY. 8
a. Ovarian Tumours.
b. Ovariotomy.

G. UTERUS, &c. 16
a. Prolapsus.
b. Tumours.
c. Vaginal Fistulæ.
d. Cancer.
e. Contusion of Vulva.

CLASS VIII.

A. EYE. 5
a. Injury to Orbit.
b. Tumour in Eyelid.
c. Pannus Corneæ.
d. Iritis, Specific.
e. Iridectomy for Glaucoma.

B. EAR. 2
a. Congenital Displacement.
b. Carcinoma of Auricle.

C. NOSE. 4
a. Lupus.
b. Ozæna.
c. Polypus.

D.	MOUTH, &c.	15
a.	Harelip.	
b.	Abscess of Tongue.	
c.	Ranula.	
d.	Epithelioma of Lip.	
e.	Epithelioma of Tongue.	
f.	Epulis.	
g.	Cleft Palate.	
h.	Tumour of Palate.	
i.	Ulceration of Fauces.	
k.	Stricture of Œsophagus.	
E.	LARYNX AND TRACHEA.	15
a.	Specific Ulceration.	
b.	Tumour.	
c.	Tracheotomy.	
d.	Cut Throat—Suicide.	
F.	RECTUM.	20
a.	Condylomata.	
b.	Hæmorrhoids.	
c.	Abscess near to.	
d.	Fistula.	
e.	Malignant Disease.	
	Total number of cases	1309

In the first class we find ordinary bruises, or, as they are technically called, contusions, in which I have followed strictly the legal definition that these differ essentially from wounds, there being with them no true breach of surface. Of these I have had, under treatment, 142 cases arranged in sub-classes, as here shown, from which we find that the greatest number have occurred upon the hip, lower limb, and chest, the others being pretty equally distributed over the head, face, and extremities. As to the causes, they are as variable as possible.

TABLE I.

CLASS I.—A. Contusions.

Part injured.	Under 10 years.		Under 20 years.		Under 40 years.		Under 60 years.		Over 60 years.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
a. Head	2...	1 ...	1...	......	5...	1...	......	......	1 ...	......	9...	2...
	......	......	......	......	4...	1...	2...	......	......	......	6...	1...
b. Face	1...	......	1...	......	......	1...	......	......	......	......	2...	1...
	......	......	......	......	1...	1...	......	......	......	1 ...	1...	2...
c. Chest and back	5..	......	7...	3 ...	14 1	......	4...	......	......	......	30 1	3...
	......	......	1...	......	4...	1...	1...	......	......	......	6...	1...
d. Abdomen and pelvis	......	......	3...	......	3...	......	4...	......	......	......	10...	......
	......	......	......	......	......	......	......	......	......	......	......	......
e. Hip and lower limb	5...	......	9...	......	23...	7...	3...	2 ...	5 ...	2 ...	45...	11...
	......	......	......	......	2...	......	1...	......	......	......	3...	......
f. Shoulder and upper limb	1...	......	3...	......	1...	1...	2...	......	......	......	7...	1...
	......	......	......	......	......	......	......	......	......	......	......	......
	14...	1 ...	24...	3 ...	46 1	10...	13...	2 ...	6 ...	2 ...	103 1	18...
	......	......	1...	......	11...	3...	4...	......	......	1 ...	16...	4...
											119 1	22...
											142	

In every case the injury has been so great as to necessitate the admission of the patient into the hospital, and if it should seem that the number is small, it must be remembered that, a very large proportion of such injuries as these are treated in our accident room, and remain outside the hospital. Therefore, in every case here reported there must have been some special reason for the admission of the patient into the wards. As to the general treatment of these cases, my experience has shown me that where the skin is unbroken there is no better application than spirits of wine or alcohol in some form. It acts as a constant stimulant to the capillaries of the surface, and keeps up that degree of vital action which, from the injury received by the contusion, it might fail to retain. I was first led to adopt this practice of always using spirits of wine as one ingredient in lotions for bruises and contusions, by being told that in the large fire brigades in London, where men, otherwise in good health, are exposed to sudden injuries by the falling of timber, bricks, stones, &c., whilst extinguishing fires, it is found that greater success attends the use of dilute spirits of wine as an application to the bruised surface than any other agent; and from experiments which have been tried with what is known in ordinary pharmacy as the tincture of arnica, and other alcoholic tinctures, it is highly probable that the spirit portion of the compound, rather than the vegetable extract, is that which chiefly acts as a stimulant to the surface. Occasionally, however, in the treatment of ordinary contusions, apart from rest, which is so essential for the recovery of such injuries, I have used the old-fashioned linseed poultice as a fomentation, generally adding to it a very large proportion of tincture of opium in cases where local sedative action was desired. I learned the value of this application from reports published by Dr. Meadows, of the Hospital for Women, Soho Square, London, in which it was stated, that after the very serious operation of ovariotomy, excellent results have attended the application to the abdomen, on the closure of the wound, of a poultice, of considerable size, made of linseed meal and hot water, with which is fully incorporated a very large proportion (fully half an ounce, or in some cases one ounce) of tincture of opium. That opium, so applied in the form of tincture, can be directly absorbed through the pores of the skin I think no one will deny, for it is often found of the greatest possible service, not only in injuries to joints, but in acute and sometimes chronic mischief, and many people, who cannot take opium by the mouth, will derive benefit by its sedative action when absorbed through the skin. I here mention the use of linseed poultices, not as an application to wounded surfaces, for I have entirely discarded their use in wounds, but only to contusions where the skin is unbroken. On one or, at the most, two occasions during the period covered by these reports in my practice in the Infirmary, has such an application been made to wounds or abscesses, and then without my knowledge, and never persevered in by my permission. Thus, I look upon the linseed poultice as a convenient means of securing warmth and moisture as a fomentation, but not to be sanctioned as a dressing for open wounds.

Of all the cases here mentioned there is but one which needs special reference, and that is a case in which I observed that very unusual and very peculiar condition of *punctiniform ecchymosis,* which has been thought to be indicative of the previous existence of tension of the vascular system, associated with threatened strangulation. It occurred in the person of a little boy, aged six years, who was crushed between the wheel of a lurry and a gate, and was brought into the hospital with extensive contusion over the left side of the face and head, with sub-conjunctival ecchymosis in the left eye, compression of the front and back of the chest, with very superficial ecchymosis of a red colour, and decidedly punctiniform, so that when carefully looked at the whole surface was found to be studded with vascular spots of star-shape form, sprinkled pretty equally over the whole of the trunk. These were, doubtless, separate spots of extravasated blood, produced by the bursting of small capillary vessels. This condition of things was associated with a good deal of distress in breathing and some confusion of intellect, a little simulating concussion, perhaps due to general faintness, from which the boy rallied in a few hours; he remained in the hospital five days, and ultimately recovered completely. Day by day I noted a slight change of colour in these vascular spots, although they did not run through all the shades, from blue to green and yellow, of ordinary ecchymoses. I have seen instances of this same kind of ecchymosis in a few cases where death has been caused by compression of the chest. During an alarm of fire at a large music hall in this city, a number of persons were knocked down and crushed to death, nearly twenty of them being brought to the infirmary dead. Out of that number I observed four or five in whom this peculiar condition of the surface was to be detected. It seems to indicate the greatest possible jeopardy to the persistent circulation of the blood, and might in some few cases (as in threatened strangulation during criminal assaults) be of service in determining some medico-legal questions.

In the second division of the first class I have placed wounds, and these I have broken up into five sub-classes, as shown in the annexed table.

TABLE II.

CLASS I.—B. Wounds.

Class of wound.	Under 10 years.		Under 20 years.		Under 40 years.		Under 60 years.		Over 60 years.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
a. Contused	3	...	7 1	...	12	1	6	...	3	...	31 1	1
	...	...	1	...	...	...	2	...	...	...	3	...
b. Lacerated	7	1	20	4	10 1	3	4 1	...	1	1	42 2	9
	...	...	...	...	1	2	1	...	...	...	2	2
c. Punctured	2	...	1	1	1	1	2	...	...	...	6	2
	...	...	...	...	...	...	1	...	...	...	1	...
d. Incised	...	...	3	...	6	...	...	...	...	...	9	...
	...	...	...	...	2	...	...	...	...	...	2	...
e. Gunshot	1	...	1	...	3	...	1 1	...	1	...	7 1	...
	...	...	...	...	...	...	1	...	...	...	1	...
	13	1	32 1	5	32 1	5	13 2	...	5	1	95 4	12
	...	...	1	...	3	2	5	...	...	...	9	2
											104 4	14
											122	

The contused, lacerated, punctured, and incised wounds have all been treated much upon the same principles as have regulated my practice in wounds generally. Those in which the contusions were excessive required more care than the lacerated, and these more than either the punctured or incised, assuming that by the infliction of the wound no very important part had been damaged. The one grand principle of treatment which has regulated my conduct has been the avoidance of putrefaction on the surface of such wounds; and to relate the various preparations which I have employed during the five years, would be to describe a course nearly parallel to the history of antiseptic surgery during this period. I commenced, before I had the advantage of learning Professor Lister's views on this matter, with the watery solution of carbolic acid; and even before I knew he had undertaken to investigate this subject, both practically and theoretically, I had given instructions to my dressers to use, in every wound we had to treat, such a quantity of this solution that at all times the dressing should smell slightly of the agent employed. But I soon discovered that, from its volatility, this condition of things could not be long preserved, and that the watery solution of the acid, although efficacious when used in certain ways, fails to be of service if carelessly employed, and many wounds, when treated with carbolic acid lotion, will, in a few hours after its application, present all the phenomena of advanced putrefaction. I therefore gladly availed myself of Prof. Lister's first suggestion to use the acid mixed with oil, for I soon found that this combination retained the antiseptic properties for a much longer period. Again, it was found that a mixture of glycerine and the acid was rather less unpleasant to use, and equally serviceable, except in those rare cases where, from some peculiarity of the skin, glycerine itself irritates excessively. These three applications, therefore—the watery solution, the mixture with oil, and the mixture with glycerine—formed our staple dressings for wounds of this class. In gunshot wounds, especially, I have found very great benefit from the oil dressing, and I am inclined to think that in military practice it will be the most acceptable and generally useful. In order to correct the irritating effect of the carbolic acid which is apt to occur upon some skins, I combined with it some salt of lead, either the dia-acetate, as in the ordinary lead lotion, mixed with the watery solution of the acid, or the nitrate of lead dissolved in the same manner, and which seems to be superior to it in producing a less deposit of white concretion upon the surface. By this admixture of lead with the watery solution of carbolic acid we may often gain great benefit without the attendant inconvenience of local irritation.

Among the incised wounds the most interesting was the following, and seeing that it terminated so fortunately I think it well to place it on record. It was the case of a man, aged twenty-five years, a smith by trade, who, it is reported, whilst under the influence of drink and in a very excited state, on account of some quarrel with his wife whilst at dinner, took up a large knife—I believe a carving knife—and cut deliberately through the palm of his right hand, just at the lower part, close to the roots of the fingers and a little above the level of the heads of the metacarpal bones. When admitted shortly afterwards, Dr. Carruthers, then acting as house-surgeon, reported that he could see the bones at the bottom of the wound, and that all the super-adjacent structures had been divided, including, of course, the tendons. The reason assigned for such an insane act was some determination which he had arrived at, that no more work should be done by this bread-winner of the family. He was admitted into the infirmary and I saw him very shortly afterwards. I poured into the wound a very strong and almost saturated solution of tannin, which I was at that time experimenting with as a dressing for wounds, thinking it might possess some preservative antiseptic properties, but further experience of it proved this to be fallacious. I so arranged that none of the solution remained at the bottom of the wound after it had to some degree arrested the somewhat sharp hæmorrhage. Over the whole was placed a thick pad of lint thoroughly saturated with the same tannin solution, the hand was flexed and folded inwards and so retained by narrow bandages; the man was placed in bed, the limb raised upon the pillow and lightly tied to the upper part of the bed, so that it could not be disturbed during sleep, and in that way it was retained for six clear days. On account of the peculiar circumstances of the case, as soon as the man recovered from the fit of excitement I have described, he became so painfully alarmed at the possible effects of his self-inflicted wound that I had no difficulty whatever —chiefly through the influence of fear—in making him keep the limb absolutely quiet. The result was that on the sixth day, when I examined the wound, it was found to be united as nearly as possible in its whole length, and by the continuance for a few days of similar treatment, succeeded by the use of what is known as the red lotion—a solution of sulphate of zinc in water with spirits of lavender—the wound healed up perfectly within fifteen days. He then became an out-patient and was watched for some time afterwards, for this reason, that being connected with some sick club he attempted to get compensation for what he represented as an accidental wound. I am not certain how the case was settled, but I believe he received some gratuity in consideration of the delirious state he was in at the time the wound was inflicted. With regard to the effect upon the divided nerves, the following are my notes six weeks after he left the hospital and almost nine from date of injury:—"He now has great power to move the fingers of the right hand, but there is loss of sensation on palmar side of radial half of ring finger and both sides of middle and index finger. At the tips of these are slight ulcerations, with vesicles." Fourteen days afterwards I note—"the ulcers at the tip of the ring finger healing; vesications on middle of palmar surface of middle finger, none on index finger; old wound is perfectly healed." About three weeks after this I note—"All the vesications are healed; can move fingers and hand to a wonderful degree; can only feel in the thumb, and not in the little finger, and hardly at all in any of the others. Recommended to keep hand very warm during approach of winter." I saw this patient some months afterwards, and the constant feeling of numbness in the fingers was the only symptom which indicated the amount of injury which had been received, for there was a very serviceable degree of tactile sensation.

None of these wounds presented anything very peculiar, except those connected with gunshot injuries, and in this class, although in a non-military hospital, some cases of considerable interest have occurred. One of the most peculiar was that of a man, aged thirty-two, who, about five months before his admission into the infirmary, had sustained a gunshot wound from the explosion of a double-barrelled gun while firing it. Part of the stock of the gun had lacerated the left forearm on its internal side; the wound was two inches long, and was partly healed up in about three weeks, but never completely so, as there always existed at the lower part of it a small sinus or aperture. This remained open until the time of his admission into the infirmary, which was nearly five months from the date of the accident. During this long period it was observed that from time to time he was liable to sudden bleedings from the wound, particularly after slight muscular exertion or any peculiar movements of the limb. When I saw the case I determined to place him in the hospital, and, if necessary, to cut down upon the track of the wound and remove any portion of bone or foreign matter which might be found there. He was first taken into the hospital with the object of merely watching him to see if it was really true that he had these sudden attacks of profuse hæmorrhage, which he said had occurred more than twenty times since the injury, lasting for a while and then ceasing spontaneously, About the fifth day after his admission, when he said it bled for the twenty-ninth time, it suddenly burst out bleeding, a large stream of arterial blood spurting out from the wound. The tourniquet was placed on the arm, and as I was fortunately in the hospital at the time, chloroform was administered and I proceeded to carry out my plan of action. Passing a probe along what appeared to be only a sinus, I felt something which seemed to be like a piece of loose dead bone; still further enlarging the opening, I could feel it plainly, and once more increasing the size of the wound I proceeded to draw it out with a pair of necrosis forceps, when to my astonishment it turned out to be, not a portion of bone, but a large piece of the breech of the gun-barrel, nearly three inches in length and three quarters of an inch in width, and forming very nearly one quarter of the circumference of the barrel. This being removed, it was found that underneath it there was an opening in the anterior interosseous artery, upon which one end of the piece of iron had rested, its concave surface fitting round the shaft of the ulna, compressing the artery. This seemed to have acted as a valve, and each time the limb was moved in one particular direction the artery was released from pressure and the blood escaped, then by some other change of place it compressed the vessel and stopped the bleeding. In this way only can I account for the very unusual condition that the wound should have so nearly healed, and that the man should have experienced such a number of separate attacks of bleeding as I have described. The artery was now divided transversely, the ends tied with catgut ligature, and the wound treated with strips of lint dipped in a solution of tannin, and in less than four weeks from the date of the operation the patient was discharged perfectly cured. In another case, in which a man was shot in the upper part of the thigh by a bullet, which passed through the limb and escaped at the posterior part, almost at right angles to its axis, the only treatment which was employed, and with complete success, was to pour into the wound the carbolated oil so as to fill the track of it and exclude the air. In a few days a very favorable action was observable, and in little more than three weeks the wound was healed.

These injuries by pistols and guns have illustrated the fact that persons are very apt to become careless in the use of fire-arms, and that a very large number of such accidents are entirely preventible. In one case, a man who was fatally injured by the explosion of a gun explained to me, on his admission to the hospital and while quite conscious, that he was out shooting small birds, and in order that the birds might not become alarmed by the sight of the gun he placed it muzzle downwards deeply in a very long pocket in the flap of his coat, so that the trigger even was within the pocket. He walked along with it in this careless manner, and when attempting to pull it out of the pocket the trigger caught in the lining, the gun went off, and the contents were lodged in his leg and foot, from the effects of which he died in a few hours after his admission, and before amputation could be performed.

I have included in this sub-class scalds and burns, and in the totals annexed I have drawn a distinction between these two classes of injuries, for it will be found that scalds are for the most part less dangerous and less serious than burns. In scalds it will generally be observed that the difference in the effect of water, when free from greasy matter or oil, and steam, is very considerable. When any portion of the surface of the body is exposed to steam escaping from some aperture, or possibly set free by explosion, and losing its temperature with great rapidity, then the scalds will be, in many cases, more extensive than severe. Accidents from boiling water, particularly where there has been immersion, are next in intensity, while the same fluid containing grease, or being of a high specific gravity, as coffee with milk and sugar in it, and likely to rest some time upon the surface, produces a deeper injury, more intense in its effects and approaching more nearly in its nature the characters of a burn. In burns, also, the particular way in which the injury has been received has to be noted. A very large number of those cases which I have treated have occurred in little children, by the clothes catching fire, or from falling upon the fire; a few, in adults, by explosions of gas, as in coal mines and gas works, or the most intense forms of burning, where some portion of the body has come in contact with molten lead, zinc, or iron.

TABLE III.

CLASS I.—B. Wounds.—*f*. 1. Scalds.

Causes.	Under 1 year.		Under 5 years.		Under 10 years.		Under 20 years.		Over 20 years.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Hot water, coffee, tea, &c. ...	...	...	5	1	1	1	2	...	2	...	10	2
	...	...	...	...	...	...	...	...	...	...	...	...
Boiling water	...	...	2	...	...	...	2	1	..	...	4	1
	...	...	...	...	...	...	...	...	...	...	...	...
Steam	...	...	...	...	...	...	1	...	2	...	3	...
	...	...	...	...	...	...	...	...	1 1	...	1 1	...
Hot water with grease	...	...	2	...	...	...	1	...	...	...	3	...
	...	...	...	...	...	...	...	...	...	...	...	...
	...	...	7 2	1	1	1	4 2	1	4	...	16 4	3
	...	...	...	...	...	...	...	...	1 1	...	1 1	...
											17 5	3
											25	
2. Burns.												
Clothes catching fire	...	...	3 4	3 1	2	6 1	...	1 2	...	1	5 4	11 4
	...	...	...	...	...	...	...	...	...	1	...	1
Falling on fire	...	...	1	1	1	1	1	...	...	1	2 1	2 1
	...	...	...	...	...	...	...	...	1	1	1	1
Flame from candle	...	...	...	...	...	2	...	...	...	...	...	2
	...	...	...	...	...	...	...	...	...	...	...	...
Explosion of gas	...	...	...	...	...	...	...	...	3 1	...	3 1	...
	...	...	...	...	...	...	...	...	...	...	...	...
Molten metal	...	...	...	...	...	...	1	...	2	...	3	...
	...	...	...	...	...	...	...	...	...	...	...	...
	...	...	4 4	3 2	2 1	9 1	2	1 2	5 1	2	13 6	15 5
	...	...	...	...	...	...	...	...	1	2	1	2
											14 6	15 7
											42	

As to the method of treatment adopted in these cases, although, after the first shock of the accident, the prognosis, all things considered, is more favorable in the scald than in the burn, the application has been the same in both; namely, a material now pretty generally known in the hospital by the name of the "burn ointment." I have found it of the greatest possible service. For its exact composition I am indebted to Mr. Hoare, a surgeon, who has had great experience of burns produced by the explosion of gunpowder in the large works for the manufacture of that article at Faversham and Dartford, in Kent. I subjoin the formula for the preparation of it—

Ceratum Resinæ Acidum.

℞ Resinæ flavæ, ℥iv (in winter, ℥x).
Ceræ flavæ,
Olei Olivæ, āā ℥xx (in winter, ℥xxx).
Terebinth. Chiæ, ℥viij.
Picis Burgund., ℥iv.
Zinci Oxidi, ℥iv.
Solut. Acid. Carbolici,* f℥iss.
Misce, fiat unguentum.

We now call it *Ceratum Resinæ Acidum,* and take care always to have a quantity in the wards ready for immediate use spread on large pieces of lint, in the manner of a plaster, and kept in a closed flat tin box to protect it from the air. Immediately on the admission of any case of scald or burn into the infirmary, as soon as the clothes have been carefully removed, so as to disturb the injured surfaces as little as possible, they are covered with broad strips of this lint plaster, and, although the little patients generally cry out very lustily at the moment of its application, as if it caused a certain burning sensation, it is wonderful to note how quickly this ceases, and a condition characterised by absence of pain ensues. It would almost seem as if the carbolic acid which it contains, and perhaps, also, the resinous terebinthinated substances in it, acted as local anæsthetics to the cutaneous nerves, for we constantly find children treated with this ointment pass very shortly into a state of repose, and sleep without the use of any opiates. Having occasionally been in the ward at the moment when a burn case was admitted, and watched the whole process of dressing here described, I can personally bear testimony to the tranquillising effects thus produced. There is, moreover, this great advantage in the use of this preparation, that it preserves the excretions of the part, which will continue unchanged from local putrefaction throughout the whole treatment of the case; and I have repeatedly seen scalds and burns of very large extent treated in this way from first to last, during many weeks, and the dressings only removed each second or third day, without the slightest offensive odour or unpleasant discharge. This ointment, however, is somewhat tedious to make, and cannot be easily ordered in the hurry of ordinary prescriptions, but a very good substitute for it, although not quite equal in its properties, can be quickly made in the following way:—Carbolic acid, 20 drops; oxide of zinc, one drachm; rub these together, and add one ounce of resin cerate, the whole being mixed while cold, so as not to volatilize the acid. This is an excellent dressing for bed-sores and sluggish ulcers which excrete a fetid discharge.

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* *Solutio Acid. Carbolici.*

℞ Acid. Carbolici puri
(Calvert's Crystals, melted), f℥xvj.
Glycerinæ puræ, f℥viij.
Aquæ destillatæ, f℥viij.
Misce, fiat solutio.

We next come to the cases of amputation which have occurred during this period. They are in all 61; 30 for accident, and 31 for disease, and they are shown in the annexed tables, from which it will be seen, that out of the entire number there have been seven deaths in the cases for accident and nine in those for disease, taken at all ages and in all degrees of severity.

TABLE IV.

CLASS I.—C. Amputations.—*a*. Accidents.

No.	Initials.	Age.	Sex.	Part.	Side.	Nature of operation.	Re-sult.	Days in hospital aft. ope-ration.	Cause.
1	P. F.	15	M.	Shoulder-joint	R.	Flaps	Rec.	52	Machinery.
6	W. F.	16	M.	Low. 3rd arm	L.	Circular	Rec.	39	Machinery.
	H. K.	30	M.	Near shoulder	R.	Flaps	Rec.	37	Crane fell.
	M. M.	16	F.	Mid-arm	R.	Flaps	Died	16 hrs.	Gunpowder.
	W. R.	12	M.	Mid-arm	L.	Circular	Rec.	26	Machinery.
	W. R.	9	M	Low. 3rd arm	L.	Circular	Rec.	33	Railway.
	T. S.	53	M.	Arm	L.	Flaps	Died	40	Machinery, alb in U.
6	J. B.	42	M.	Mid-forearm	L.	Flaps	Rec.	40	Machinery.
	W. H. B.	22	M.	Low.3rd forearm	L.	Flaps	Rec.	31	Cog-wheels.
	W. C.	48	M.	Low.3rd forearm	R.	Flaps	Rec.	49	Machinery.
	W. E.	18	M.	Low.3rd forearm	L.	Flaps	Rec.	90	Rollers.
	W. F.	38	M.	Mid-forearm	R.	Flaps	Rec.	29	Cog-wheels.
	F. G.	32	M.	Low.3rd forearm	L.	Flaps	Died	8	Machinery.
6	E. D.	13	M.	Partial, hand	L.	Flaps	Rec.	60	Cog-wheels.
	W. H.	29	M.	Partial, hand	L.	Flaps	Rec.	9	Gunshot.
	A. H.	22	M.	Partial, hand	R.	Flaps	Rec.	12	Circ. saw.
	T. M.	14	M.	Partial, hand	R.	Flaps	Rec.	35	Crush.
	M. M.	44	M.	Thumb	R.	Circular	Rec.	19	Cog-wheels.
	E. S.	16	M.	Partial, hand	R.	Flaps	Rec.	13	Machinery.
1	B. T.	14	M.	Hip-joint	L.	Flaps	Died	8 hrs.	Railway.
6	T. B.	60	M.	Upp. 3rd thigh	R.	Circular	Died	6 hrs.	Railway, syncope.
	C. F.	23	M.	Upp. 3rd thigh	L.	Flaps and circular	Rec.	41	Comp. fract. thigh.
	H. G.	24	M.	Upp. 3rd thigh	L.	Circular	Died	1 hour	Railway.
	J. H. G.	21	M.	Upp. 3rd thigh	R.	Flaps and circular	Rec.	43	Machinery.
	T. J.	14	M.	Upp. 3rd thigh	L.	Circular	Rec.	113	Railway.
	W. S.	61	M.	Mid-thigh	R.	Flaps and circular	Rec.	78	Crush.
3	E. D.	13	M.	Upp. 3rd leg	R.	Flaps (Fergusson)	Rec.	81	Machinery.
	J. L.	38	M.	Upp. 3rd leg	R.	Flaps (Fergusson)	Rec.	52	Crushed foot and leg.
	S. M.	28	M.	Mid-leg	L.	Flaps (Fergusson)	Died	51	Railway.
1	J. C.	51	M.	Partial, foot	R.	Flaps	Rec.	52	Railway.
30 cases.									

TABLE V.

CLASS I.—C. Amputations.—*b.* Disease.

No.	Initials.	Age.	Sex.	Part.	Side.	Nature of operation.	Result.	Days in hospital aft. operation.	Disease.
1	F. G.	19	M.	Mid-arm	R.	Circular	Died	5	Elbow.
3	W. B.	45	M.	Up. 3rd forearm	R.	Circular	Rec.	22	Epithelioma, shoulder-joint afterwards.
	T. E.	15	M.	Forearm	R.	Flaps	Rec.	31	Re-amputation.
	E. N.	39	F.	Low. 3rd forearm	L.	Teale	Rec.	20	Carpus.
2	J. B.	19	M.	Hip-joint	L.	—	Rec.	62	Tumour, thigh.
	S. E.	17	M.	Hip-joint	L.	—	Rec.	57	Tumour, thigh.
14	J. C.	22	M.	Up. 3rd thigh	R.	Flaps	Rec.	65	Re-amputation.
	T. D.	51	M.	Mid-thigh	L.	Circular	Rec.	50	Epithelioma, leg.
	J. D.	32	M.	Mid-thigh	R.	Flaps and circular	Died	6	Knee.
	G. E.	54	M.	Thigh	L.	Carden	Died	7	Knee.
	A. G.	36	F.	Low. 3rd thigh	R.	Circular	Rec.	113	Knee.
	J. G.	21	M.	Mid-thigh	R.	Circular	Rec.	40	Knee.
	G. H.	35	M.	Up. 3rd thigh	L.	Circular	Died	2	Acute gangrene.
	C. J.	24	M.	Mid-thigh	R.	Circular	Died	20	Knee, large abscess.
	E. L.	18	F.	Thigh	L.	Carden	Rec.	43	Tumour, leg.
	T. M.	51	M.	Mid-thigh	L.	Circular	Died	10	Tumour, knee.
	J. S.	32	M.	Mid-thigh	L.	Circular	Rec.	43	Knee.
	J. T.	22	F.	Thigh	R.	Carden	Died	22	Old ulcers, alb. in U.
	M.A.T.	11	F.	Mid-thigh	R.	Teale	Rec.	64	Knee.
	C. W.	36	M.	Thigh	R.	Carden	Rec.	142	Epithelioma, leg.
6	A. B.	36	F.	Up. 3rd leg	L.	Teale	Rec.	69	Ankle.
	J. B.	43	M.	Low. 3rd leg	L.	Circular	Died	17	Ankle.
	G. C.	40	M.	Up. 3rd leg	L.	Flaps (Fergusson)	Rec.	39	Old ulcers.
	J. D.	71	M.	Up. 3rd leg	R.	Circular	Died	10	Tibia and atheroma.
	E. L.	26	F.	Low. 3rd leg	L.	Teale	Rec.	53	Tarsus.
	T. T.	37	M.	Mid-leg	L.	Flaps (Fergusson)	Rec.	78	Old ulcers.
5	H. D.	42	M.	Ankle	L.	Syme	Rec.	37	Tarsus.
	C. H.	15	M.	Ankle	R.	Syme	Rec.	119	Tarsus.
	M. M.	22	F.	Ankle	L.	Syme	Rec.	60	Tarsus.
	J. T.	12	M.	Ankle	R.	Syme	Rec.	36	Tarsus.
	S. W.	33	F.	Ankle	R.	Syme	Rec.	57	Tarsus.
31 cases.									

TABLE VI.

Cases of Death after Amputation—For Accident.

Part.	Initials.	Age.	Sex.	Time after operation.	Probable cause.
Arm	M. M.	16	F.	16 hours	Shock.
Arm	T. S.	53	M.	40 days	Old albuminuria.
Forearm	F. G.	32	M.	8 „	Acute pleurisy, with effusion.
Hip-joint	B. T.	14	M.	8 hours	Shock.
Thigh	T. B.	60	M.	4 „	Shock, syncope.
Thigh	H. G.	24	M.	1 hour	Shock.
Leg	S. M.	28	M.	51 days	Large abscesses from contusions.
				For Disease.	
Arm	F. G.	19	M.	5 days	Hæmorrhage and exhaustion after very old disease of elbow.
Thigh	J. D.	32	M.	6 „	Secondary hæmorrhage.
Thigh	G. E.	54	M.	7 „	Exhaustion, syncope.
Thigh	G. H.	35	M.	2 „	Acute gangrene.
Thigh	C. J.	24	M.	20 „	Large abscess and exhaustion.
Thigh	T. M.	51	M.	10 „	Exhaustion after long illness.
Thigh	J. T.	22	F.	22 „	Obscure kidney disease.
Leg	J. B.	43	M.	17 „	Secondary hæmorrhage and exhaustion.
Leg	J. D.	71	M.	10 „	Exhaustion.

When, however, these lists are carefully examined, we may observe that, by eliminating the milder cases, such as amputations of the hand and partial amputations of the foot, the average death-rate will become slightly increased; yet the results of the more serious amputations will bear inspection, for in the returns of amputations of the thigh for accident, which are generally so fatal, making deductions for two out of six cases which died within twelve hours of the operation, the four remaining as recoveries show, under the circumstances, a very good result. In the case of amputation of the hip-joint the death took place within twelve hours after the operation, but in that of amputation of the shoulder-joint the patient recovered. The other cases of accidents also show a good return, and in amputations of the leg one case out of three died fifty-one days after the operation, while the other two recovered. Then, in amputations of the arm, two cases died, one in sixteen hours and one forty days after the operation, but in this latter case the man had been the subject of chronic albuminuria. Out of six amputations of the forearm there were five recoveries. As stated above, out of thirty-one cases of amputation for disease there were nine deaths. Two cases recovered in amputation at the hip-joint and eight recovered after amputation of the thigh out of fourteen cases. In the leg there were four recoveries out of six cases; and in amputation of the ankle (Syme's operation) all the cases, five in number, recovered.

In all these cases, from the first one, an amputation of the thigh for tumour of tibia close to the knee-joint, which was performed in February, 1867, to the very last, some system of antiseptic treatment was observed. At first the watery solution, then the oil, then the lac plaster of Prof. Lister, then my own cerecloth, next his muslin, and now my present imitation of it—the resin-cloth which I have so recently described; one chief object being steadily kept in view in all these efforts, namely, the more complete avoidance of those putrefactive changes in the excretions of the wounds, occasioned by these operations, to which I have so frequently referred, not only in the pages of these 'Reports,' but in other places.

Those who have endeavoured to carry out these principles alone can tell the numerous complicated circumstances which interfere with their full development. Many of the wounds produced by amputation are apt to close in on the surface, and leave a cavity in the centre, from which, at the very time we are congratulating ourselves on the successful issue of the case, they develope unfavorable action and cease to heal kindly. The greatest care, therefore, is needed in the first adjustment of the surfaces of the amputation flaps, so as to ensure their adhesion throughout the entire depth of such wounds. The drain tube of Prof. Lister is certainly a very valuable means of preventing complications arising from the healing of the surface and the formation of this central cavity. The chief feature of a local nature, as compared with constitutional effects, to be remarked upon as a consequence of the antiseptic dressings of amputation wounds is, that, whatever the particular size or shape of the flaps at the time of the operation, these will be preserved to a degree which is rarely to be met with under any other methods of dressing, for with the absence of pus there will be an entire freedom from ulceration or sloughing of the edges of the wound, and a corresponding saving of tissue; whereas all surgeons know how constantly it happens that even where, at the time of an amputation, they have left what is called sufficient flap, yet in the subsequent progress of the case, from the sloughing of the edges, the stump becomes conical, and the bone hardly covered. This single fact, apart from all others, is a most valuable one in the surgery of amputations, for we can thus predicate, with something like certainty, that the structures we leave in the operation shall be preserved throughout the treatment. I say nothing of the absence of pain and constitutional irritation which must result when we can secure the patient from the additional risk of abscesses, skin inflammation, and deep absorption of injurious matters, either through the open mouth of veins, or more directly by the lymphatics. It has been at all times a subject of observation to me, and one which I invariably point out to those who watch my *clientelle* in the wards, that, within a very few days after the amputation of a limb treated by antiseptic measures, the stump loses that exquisite sensitiveness which attends upon deeply seated inflammatory changes, and the patient can often bear to be turned over in bed, or allow the stump to be moved to a degree which would astonish those who have been accustomed to find inflammatory changes of extreme intensity, the usual attendants upon the healing processes of large wounds. Ever since Mr. Lister first suggested his antiseptic catgut ligatures for tying arteries, they have been employed in each of the cases here recorded. Previous to this, in some one or two amputations and in some of the wounds from the removal of the breast, I tried the different methods of acupressure designed by the late Prof. Simpson, but with very poor success at the time, and in the after treatment of such cases the patients complained bitterly of the pain produced in the removal of the needles. More recently—perhaps, within the last twelve or eighteen months—I have used a combination of torsion and ligature in my amputations. When torsion fails, or from any cause is not readily applicable, catgut ligatures are resorted to; but, certainly, where the former plan can be carried out it is the most elegant and effective means which we possess of arresting hæmorrhage in surgical operations. As to the number of days during which each of these cases of amputation have remained in hospital from the date of operation to the time of discharge, I do not think the numbers quoted in the table can be taken as of much value. Many of the cases which have come from a distance have stayed in the hospital for a longer period, on this account, than they would have done had they lived in the neighbourhood and been transferred earlier to the accident room, or sooner become out-patients. Again, in comparing together cases of amputation in reference to the exact duration of treatment, we can only go upon very general principles, for there is so much to be said on the influence of constitution and the peculiar circumstances of the accident that, it is impossible to define, with anything like precision, the time required for the healing of any given case. And, even in the statistics of recovery, it will often be found that surgeons differ very much in their estimate of what is termed healing of the stump. Some say that the stump may be reported as being healed so soon as the wound has become nearly superficial; others require that before the healing process shall be pronounced complete perfect cicatrization and covering in by cuticle shall have been accomplished. I think, if the statistics of some hospitals were carefully looked into, many cases said to be healed would not be found absolutely cicatrized in the latter sense, but in the returns which are given in these tables, it may be assumed that every case, when allowed to go out of hospital after amputation, had the wound so nearly healed that probably not much more than half a square inch of granulating unhealed surface still remained. Occasionally, of course, an amputation wound will be delayed in its cicatrization by the presence of a small sinus, through which at last a fragment of dead bone is expelled, and the cure is then completed.

The last division in this class is for ulcers (Table VII), and respecting these I have not much to report. I have found, what has been often observed, that cases of ulcers taken into the wards of a hospital, invariably improve in appearance, soon after their admission.

TABLE VII.

CLASS I.—D. Ulcers.

Nature of Ulcer, &c.	Under 10 years.		Under 20 years.		Under 40 years.		Under 60 years.		Over 60 years.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
a. Simple	...	...	2	1	1	2	2	...	...	...	5	3
b. Indolent	...	...	1	1	3	6	3	10	2	...	9	17
c. Varicose	...	...	...	1	1	3	1	3	1	1	3	8
d. Eczematous	...	1	1	...	...	1	...	1	1	...	2	3
e. Syphilitic	...	...	...	2	5	8	4	3	...	...	9	13
f. Epithelioma	...	...	...	...	1	1	4	2	2	...	7	3
	...	1	4	5	11	21	14	19	6	1	35	47
											82	

As to special methods of treatment, if the ulcer was not due to constitutional cachexia, the treatment consisted mainly in rest and cleanliness, the latter result being secured by some of those antiseptic applications which I have already named, chiefly in the form of watery solution. For indolent ulcers, which form a large proportion of this class, I have tried, by means of radiating incisions on their edges, and by cuts made parallel to their margins, to release the tension of the skin; elevation of the whole limb on an inclined plane; Baynton's plan of plaster and bandage; Higginbottom's system, with a very strong solution of nitrate of silver; Prof. Syme's plan of blistering; and pressure applied with a tin-plate covering for the wound and strips of plaster and bandage to the surrounding tissue. All these methods and some others, have served their purpose according to circumstances, there not being any one special system which I could speak of as having been applied exclusively to every case. In all the ulcers, as often as could be managed and as soon as the granulations had risen to the level of the skin, some system of transplantation was practised; and in some instances the changes so set up advanced with marvellous rapidity. It almost seemed as if the formation of a little island of healthy skin in the centre of a sea of granulations induced a more rapid nutritive change in them at the border of the ulcer, so that we always noted, where a case of skin grafting was successful, that the size of the ulcer diminished principally by an in-growth of its edges. As to the permanence of cure in these cases of transplantation I cannot say much; for, on several occasions, after the ulcers had healed and remained so for a few weeks, the patient returning to his usual occupation with a depending position of the limb, soon had to make fresh application at the hospital for readmission with renewed or even fresh ulcerations. In contrasting the syphilitic ulcers with those of the strumous type, I have observed that, while the true strumous ulcer sometimes presents a sharp cut edge, something like the syphilitic, dependent, perhaps, in each case on a low vital condition, the strumous ulceration generally burrows at its edges some distance beneath the skin, which assumes a cold congested appearance, while the syphilitic does not. These strumous cases are those which seem to do best by the removal all this loose skin and trimming of the margin of the ulcer with curved scissors, which sets up fresh action and stimulates the growth of new tissue. There are, of course, cases in which we have a combination of these two conditions, the syphilitic taint and strumous habit, producing a strumo-syphilitic ulceration. Here we may probably find the ulcer in the usual situation at the back of the leg with the form either of a true circle or a crescentic outline, the edges at one part sharp and defined; and at another undermined or burrowing. Such cases require a double method of treatment, attention to the general constitutional powers, and specific treatment combined. Here we are sure to observe benefit in the use of the iodide of iron or of potassium, and, at the same time, the application of some mercurial preparation to the sore itself, as the black wash or the red ointment. In ulcerations complicated with eczema, as soon as their true nature has been detected by observing the surrounding irritation of the skin and the vesicular character of the eruption, soothing local applications and, internally, the administration of arsenic with iron, after Mr. Erasmus Wilson's valuable form for the *ferro-*

arsenical mixture, have invariably been followed by good results. For the epitheliomatous ulcerations, as soon as their pseudo-malignancy has become evident, their prompt removal is imperative. But many of the cases which I have seen appear to have begun as simple ulcers, to have remained in this condition for many years, and then in the second stage of their growth suddenly to have developed malignant action. In varicose ulcers it often happens where the skin has been once fairly healed by careful strapping, bandaging, and the use of well-adapted local pressure, no application will be superior to well-adjusted plaster put on carefully and changed at fixed intervals; yet it is found, even in hospital practice, patients request permission to employ elastic stockings and suchlike appliances; the great danger in the use of which is, that the pressure is so frequently misdirected and so excessive in certain parts of limb as compared with others, as to perpetuate rather than to correct the faulty dilatation of the veins.

The first sub-class of the second group contains the cases of Hernia. Of these, several, as the accompanying Table VIII will show, have been reduced by taxis without operation. The other table (No. IX) details those cases upon which herniotomy has been performed; and here, indeed, is a sad record of what Mr. Callender, in his valuable paper, has styled "Too late Operations for Hernia;" for, as is here shown, out of the entire number of seven deaths after operation, in one case only had the bowel been constricted for so short a period as sixteen hours. The next was thirty hours, then thirty-three, fifty-six hours, four days, and even in the last case for no less a period than fourteen days preceding admission into the hospital had symptoms of strangulation appeared to exist.

I have noted the condition of the fluid in the sac and the state of the bowel in each of these cases, and the facts (*vide* Table IX) will speak for themselves, as showing that as far as their influence on the general statistics of any hospital, hernia cases, being in themselves so peculiar from the circumstances to which they are liable to be exposed before admission, ought not to be included in the average of deaths so estimated.

TABLE VIII.

CLASS II.—A. Herniæ.

Not operated on, or reduced by taxis.	Under 10 years.		Under 20 years.		Under 40 years.		Under 60 years.		Over 60 years.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
a. Umbilical	......	......	......	......	......	......	... 1	......	......	......	... 1	......
b. Inguinal. R......	1 ...	......	2 ...	......	2 ...	2 ...	1 ...	......	1 ...	......	7...	2 ...
b. „ L......	......	......	......	......	1 ...	1 ...	4 ...	......	......	......	5...	1 ...
c. Femoral. R......	......	......	......	......	......	1 ...	......	......	......	......	......	1 ...
	1 ...	......	2 ...	......	3 ...	4 ...	5 1	......	1 ...	......	12 1	4 ...
											17	
Operations for—												
a. Inguinal. R......	......	......	......	......	......	......	... 1	......	2 ...	......	2 1	......
a. „ L......	......	......	......	......	......	......	......	... 1	......	......	......	... 1
b. Femoral. R......	......	......	......	......	......	......	......	......	......	... 2	......	... 2
b. „ L......	......	......	......	......	......	......	... 1	......	......	... 1	... 1	... 1
	......	......	......	......	......	......	... 2	... 1	2 ...	... 3	2 2	... 4
											8	

TABLE IX.

Herniæ.—Fatal cases.

	Initials.	Sex.	Bowel strangulated before operation.	Sac contained—
Femoral	S. B.	F.	16 hours	Tight stricture; bowel spotted by ecchymosis.
Inguinal......	M. J.	F.	30 hours	Fluid dark; bowel congested; many adhesions; great tympanitis.
Femoral	M. C.	F.	33 hours	Tight stricture; bowel with one white patch.
Inguinal......	W. H.	M.	56 hours	Fluid very dark and with omentum emphysematous; bowels purple-coloured.
Femoral	M. B.	F.	4 days	Serum fœtid and dark; bowel nearly black.
Femoral	...	M.	14 days	Bowel found burst in the sac and compressed.

Two of the cases here recorded were of special interest, one being a case of umbilical hernia in a man, which had been strangulated five days before admission, and when the patient came into the hospital collapse had already commenced, and he died in a very few hours without the possibility of entertaining the idea of operative interference.

The other case was that of a man on whom I operated on two occasions for the same inguinal hernia. The first time was after a strangulation of thirty-one hours, on the 21st of March, 1869. He recovered, was made an out-patient on the 14th of April, and, strange to say, according to my notes, on the 21st of March, 1871, just exactly two years from the previous attack, he again presented himself with a strangulated hernia on the same side, which had existed since the 19th of the month, rather more than forty-eight hours. The symptoms were very slight, being chiefly indicated by hiccup and constipation, but no vomiting of any note, and it was not until the morning of the 24th that I felt justified in repeating the operation. I found some difficulty in reducing the bowel on account of adhesions which had formed at the posterior part of the sac, but these were overcome, and although very congested, but not to a dangerous degree, it was reduced; and the man made a speedy recovery, leaving the hospital on the 26th of April.

This case will serve to illustrate the possible advantages which would occur if persons the subject of hernia were less indisposed to submit to early operations. Even this case was somewhat delayed on the second occasion at the request of the patient, but having experienced the benefit of the first operation he very soon willingly consented to the second.

Among the cases of tumour, Class II B, Table X, which I have to report, a very large proportion have been examples of the fatty tumour, and hardly need any special remark except that in the management of the wounds resulting from the removal of such tumours we often find that since no skin is taken away at the time, the wound which is made extends for some distance beneath the cutaneous tissues, and I have here observed the great advantage gained by the use of an india-rubber drainage tube according

TABLE X.

CLASS II.—B, Tumours.

Character of Tumour.	Under 10 years.		Under 20 years.		Under 40 years.		Under 60 years.		Over 60 years.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
a. Fatty	......	......	......	......	......	4 ...	1 ...	1 ...	......	......	1 ...	5...
b. Fibrous	......	......	......	1 ...	......	......	......	1 ...	......	......	......	2...
c. Cystic	......	......	2 ...	......	......	......	......	1 ...	......	......	2 ...	1...
d. Glandular	......	......	......	......	......	1 ...	1 ...	......	....	......	1 ...	1...
e. Myeloid	......	......	......	......	......	......	1 ...	......	......	......	1 ...	......
f. Malignant	......	......	......	......	1 ...	.: 1	......	3 ...	2 ...	......	3 ...	3 1
	......	......	2 ...	1 ...	1 ...	5 1	3 ...	6 ...	2 ...	......	8 ...	12 1
											21	

to Mr. Lister's suggestions. Unless this is done, in spite of pressure and other means which may be taken to prevent the accumulation of blood and other secretions from the surface of the large cavity thus occasioned, much disturbance of the parts must necessarily result and delay the union of the wound; but, by the use of a tube with the usual antiseptic precautions a wound of this nature, however extensive, may be healed very readily and with little, if any, suppuration. I had one case in which an immense tumour was removed from the thigh of a woman aged about forty. It was situated on the back of the right thigh, which measured over the tumour thirty-two inches in circumference for the extent of seventeen inches. It was said to have occupied in its growth eighteen months. The incisions required were very extensive, but fortunately the tumour was easily removed, and except for its appearance when cut, and the fact that there had been a sprouting fungus on the surface, it might have been regarded as a tumour of innocent nature. A microscopic examination of the sections of it showed too clearly the presence of double nucleated malignant cells. She went on favorably for about three weeks, and the wound had nearly healed when her constitutional powers gave way; great debility ensued, and she sank rapidly as if from general exhaustion. A *post-mortem* examination showed that all the viscera were healthy except the kidneys, which were congested and in the first stage of fatty degeneration; both lungs were in an advanced stage of grey hepatisation, and the glands in the lumbar region of the abdomen were considerably enlarged. There was also a case of tumour of the antrum on the left side in a man, aged fifty-eight, on whom I performed the operation of removing the upper jaw. This I did by Sir W. Fergusson's single central incision into the nostril, turning up the flap of the cheek so as to get a good view of anterior surface of the superior maxillary bone, and then making the usual incisions to open the antrum. On this being done with very little force, a large myeloid tumour was easily detached which seemed to be so little connected to the surrounding tissues that it fell out on to the floor at the moment of the operation. Other portions of bone were removed, the whole of the surface was sponged over with a strong solution of chloride of zinc, and the wound closed in the usual way. It healed very quickly, so that within five weeks from the date of the operation he went out, and all seemed to have done well; but, sad to tell, within three months a very rapid growth commenced in the upper part of the mouth, which soon assumed a positively malignant aspect, and, I believe, in a few months terminated his life. The point of interest in this case has always seemed to me to be the loose attachment of the tumour to the interior of the antrum, contrary to what might have been expected in malignant disease. There did not seem to be at the time of the operation any of that infiltration of tissue by malignant growth which is often observed, and I remember how I congratulated myself at the conclusion of the operation that this was possibly a tumour not malignant in its nature, yet the further progress of the case showed how fallacious it was to found such a conclusion upon such evidence. The only other case of tumour of any special interest was that of a young man, aged twenty, from whom I removed a large cystic tumour by operation. It had existed for more than two years, and had been seen by several surgeons, who had declared that its removal would be attended with considerable danger, thinking, no doubt, that it was of a cancerous nature. It was about six inches in length and five in breadth, and situated on the external side of the left elbow. It had a slightly elastic fluctuating feel, which gave the idea of a fluid covered over by dense structures. Having determined to remove it I first tapped it with an exploring trochar and canula, and from the upper part let out eight ounces of dark-coloured fluid, and when this ceased to flow about two ounces of a pale straw-coloured fluid were drawn from the lower part, showing that it was polycystic in its structure. I then proceeded with the operation, which did not present any special difficulties except those arising from troublesome hæmorrhage from many small arteries, and by careful dissection, without injuring the large nerves near the external side of the elbow, the whole mass was completely removed. The large wound thus left was treated as closely as possible on Mr. Lister's principles, and ultimately healed very well. I heard of the patient some months afterwards, and up to that time there had been no returning symptoms of the disease, but it was perhaps too soon to found any conclusions upon it, yet the cystic nature of the tumour might exclude it from the list of malignant diseases.

Next to tumours I have placed abscesses (Class II, C), because it is well known in practice that many cases of cold or slowly-formed abscesses have been mistaken for tumours, almost up to the moment of an operation; so that the late Mr. Skey used to say no tumour should be removed until the operator, just before commencing his incisions, had proved, by inserting a scalpel, that he was not dealing with a chronic abscess. In every case of abscess which I have opened I have endeavoured to follow out the principles so strongly insisted upon by Mr. Lister, and have greatly profited by acting minutely in accordance with the instructions he has given for the conduct of these cases. One instance of abscess in the thigh, which I attempted to treat in this way, was tapped with the trochar and canula in place of opening it with the scalpel. The fluid it contained flowed out freely, but just at the end of the operation, in removing the canula, some air was drawn into the abscess. This occurred in the early

TABLE XI.

CLASS II.—C. Abscesses.

Seat of Abscess.	Under 10 years.		Under 20 years.		Under 40 years.		Under 60 years.		Over 60 years.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
a. Head, neck, or chest	...	...	...	1	...	...	2	...	...	...	2	1
b. Shoulder	...	...	...	...	1	...	...	...	...	...	1	...
c. Arm	...	...	1	...	1	...	...	...	...	1	2	1
d. Forearm	...	...	...	...	1	...	1	...	...	...	2	...
e. Hand	...	...	...	...	1	...	...	...	...	...	1	...
f. Lumbar	...	...	...	1	1	...	...	...	...	...	1	1
g. Phoas iliac	1	...	1	1	1	1	...	...	...	...	3	2
h. Inguinal and pelvic	...	...	1	...	...	1	...	2	...	...	1	3
i. Buttocks and hip	1	...	...	1	5	...	...	...	...	...	6	1
k. Thigh	3	...	4	1	1	...	...	...	...	...	8	1
l. Leg	...	...	...	...	...	1	...	...	1	...	1	1
m. Foot	...	...	...	...	...	...	...	...	1	...	1	...
	5	...	7	5	12	3	3	2	2	1	29	11
											40	

stages of our practice when we used to cover such wounds with the oiled lint curtain. The bubble of air, no doubt, carried some irritating matter into the nearly emptied sac, and this abscess gave me more trouble in its after treatment, and produced more constitutional irritation, than any other which I have had to treat. All the more recent ones have been opened in a spray or atmosphere of antiseptic vapour, and now we open a large abscess on Mr. Lister's principle with the greatest confidence, and a firm conviction that the operation will be followed by the minimum amount of constitutional disturbance. The after-treatment in nearly every case will be tedious if we seek to obliterate the large sac of an abscess, which may have held a pint, or even a pint and a quarter, of fluid matter. For, assuming that we get no secondary suppuration, which is, indeed, what we seek to avoid by the Lister method, yet it must take some considerable time for the secreting membrane to become adherent on all sides of the sac, so that, as in the case of a large wound, time must be allowed for its complete and permanent closure, and if, by chance, the special processes of treatment are interrupted, even for a short time, re-secretion of pus will occur and possibly lead to chronic action, terminating in one of those troublesome sinuses which used so frequently to be the sequel to large abscesses. One abscess which I had to treat was situated in the cellular tissue, around and behind the cæcum, in a woman, aged forty-three years. A small aperture, consequent upon the spontaneous bursting of the abscess, had existed for a long time, and gave me considerable trouble; I can hardly say that any material benefit had accrued even after some months' treatment. But in this case I had an illustration of the dangers which may occur from the indiscriminate use of carbolic acid; for, in the treatment, the first thing I did was to enlarge the opening which nature had formed for the exit of matter, and thinking I might possibly arrest the further secretion of it and diminish its putrid character by the application of strong carbolic acid, I injected, by means of a syringe with a small long nozzle, about a drachm of the nearly pure acid mixed with just enough water to keep it liquid. I had hardly done this when the woman suddenly turned deadly pale, the pulse seemed almost to cease at the wrists, and it appeared as if she was in imminent danger of instant death; this lasted only for a few moments until we could get brandy and other stimulants for her relief, and although she remained in a very exhausted and faint condition for many hours afterwards, fortunately no worse results followed. I have seen very similar symptoms occur from the use of a solution of carbolic acid to the head in the case of a gentleman suffering from some disease of the scalp, with alopecia, for whom it had been prescribed; and also in a child, where it was applied mixed with oil, to a large burn, so there can be no doubt that if we employ carbolic acid as an external application without due care as to its strength it may have a most depressing and even dangerous effect upon the general circulation. The presence of melanuria, which I early observed in patients treated by this same remedy for external wounds of almost any description, shows that nature does her best to expel from the system a drug which, under some circumstances, must be looked upon as an irritant poison. We rarely see these symptoms of black urine in cases now treated; inasmuch as the strength of the preparations we employ at present is infinitely less than formerly. I had an interesting case of what seemed to be an external abscess, extending beneath the mammary glands, on the side of the chest of a young woman, aged twenty-eight years; here there were two sinuses which had discharged matter for a considerable time previous to her admission into the hospital. Although there were no external signs of her condition, a careful examination showed that for many months she had been the unconscious subject of empyema on that side which had burst spontaneously in this insidious manner. The whole of the left side of the chest was found to be disorganised from old neglected pleurisy, and at the suggestion of Dr. Morgan, who saw the case with me, a counter opening was made at the posterior and lateral part of the chest, into which a spiral wire drain-tube was inserted through which the matter flowed freely, and the sinuses in front quickly healed. This patient was for many months under observation, and appeared to go on favorably. She was twice admitted into the hospital, but, after having been in the second time for some weeks, she was attacked with symptoms of pleurisy of the right, if not also a renewed condition of the left side, with intense dyspnœa, from the effects of which she died very suddenly, and, unfortunately, no post-mortem examination was permitted.

CLASS III.—A. *Diseases of Bone.*

I have not much to remark upon in this division of my subject. I do not draw any practical distinction as a point of diagnosis between caries and necrosis, although willing to admit that such difference does exist. I take the definition that caries is "molecular death," and necrosis "molar death" of osseous tissue. On referring to Table XII it will be seen that the cases are pretty equally distributed over all ages and in all bones, but that in regard to sex the male has the preponderance, and as to particular

TABLE XII.

CLASS III.—A. Diseases of Bone.

Parts.	Under 10 years.		Under 20 years.		Under 40 years.		Under 60 years.		Over 60 years.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
1. Cranium	...	...	1	...	2	...	1	...	...	...	4	...
2. Face	2	...	1	...	...	1	3	1	...	...	6	2
3. Scapula	...	...	...	...	1	1	...	...	...	...	1	1
4. Humerus	1	1	...	...	1	...	...	...	...	...	2	1
5. Ulna	1	...	2	...	...	...	...	...	...	...	3	...
6. Radius	...	1	1	...	...	...	...	...	...	...	1	1
7. Hand	...	1	...	...	...	...	...	...	...	...	...	1
8. Vertebræ	...	...	...	...	1	...	...	...	...	...	1	...
9. Femur	...	...	1	...	2	...	...	...	...	...	3	...
10. Tibia	5	...	2	3	6	2	1	...	...	...	14	5
11. Fibula	...	...	1	...	...	...	...	...	...	...	1	...
12. Foot	...	...	3	...	3	1	1	...	...	1	7	2
	9	3	12	3	16	5	6	1	...	1	43	13
											56	

TABLE XIII.

CLASS III.—B. Diseases of Joints.

Joints.	Under 10 years.		Under 20 years.		Under 40 years.		Under 60 years.		Over 60 years.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
a. Sterno-chondral	...	...	...	...	1	...	...	...	...	...	1	...
b. Elbow	2	1	1	1	1	1	...	...	1	...	5	3
c. Wrist	...	...	1	...	...	...	...	...	...	...	1	...
d. Hip	8	4	6	2	...	4	1	...	...	...	15	10
e. Knee	1	...	6	4	8	6	3	...	...	...	18	10
f. Ankle	1	...	2	1	1	...	...	...	...	...	4	1
g. Foot	...	...	...	...	...	1	...	...	...	1	...	2
	12	5	16	8	11	12	4	...	1	1	44	26
											70	

bones the tibia is the one in which necrosis is most frequently found. Caries, I need not say, was the prevailing disease in the bones of the tarsus and in the foot generally.

In diseases of joints (Sub-class B, Table XIII) those of the knee and hip afforded the greatest number of cases, and next in order the elbow and the ankle. Yet it must not be forgotten that affections of other articulations are frequently treated as out-patients of the hospital, and therefore do not enter into these estimates of our hospital statistics. In affections of the hip and knee, perfect rest, as far as possible, or the "physiological rest" of Hilton, seems to be the essential condition of treatment. All the cases of hip-joint disease have been treated by the weight-extension plan, although some have been managed for a time by the long splint only; yet this acts much less favorably than the weight, particularly while the patient is sitting up in bed; for unless the bandage which confines the upper part of the splint to the side of the chest be painfully tight, a very evident movement of the hip-joint itself, is permitted. I have, therefore, given up the use of the long splint in hip-joint disease, and now invariably adopt the weight plan of extension. In some cases of subacute disease of the knee, I have also found the weight of great service, not only in preventing a permanent flexion of the joint, but likewise in checking those spasmodic contractions of the muscles, by which the tender and inflamed surfaces of the cartilages are brought into painful contact.

The late Mr. Holmes Coote recommended that, in chronic joint affections, we should always secure an extra amount of warmth for the part affected, urging that we had, by this means, a better chance of preserving its vital powers, and securing more energetic reparative changes; for it is notorious that most of these cases occur in persons whose constitutional powers are feeble. Hence, by the external application of warmth and moisture, by means of wetted lint, with the addition of opium, we secure a diminution of tension of the tissues surrounding the joint, and the abnormal sensitiveness of the parts. The simple method of enclosing a diseased joint, especially in its acute stage, in such a dressing as the above, and continuing the use of it until the skin becomes well corrugated and wrinkled (having the appearance of a washerwoman's fingers when well sodden in water), will, in a large majority of cases, be followed by the best results, both as regards temporary relief from pain and permanent benefit to the patient. It is curious, in some cases of acute inflammation of joints, to note how difficult it is to produce this particular condition of the skin, for the vascular action of the deeper tissues is very excessive and the skin is invariably tense and white, but so soon as by means of these emollient applications a free local perspiration is secured, and the skin assumes these peculiar characteristics, the vascular tension of the interior is diminished in the same proportion, and the desired relief obtained. Of course this plan of treatment must be accompanied by strict preservation of rest to the joint. When the pain in the neighbourhood of a joint has been to some degree reduced by such treatment as this (and I never fail to note the persistence or otherwise of the special seats of pain for each joint which Mr.Barwell has so well particularised), I have seen much good arise from passive motion in the joints either forcibly, the patient being under the influence of chloroform, or gradually, from day to day, by the action of some elastic apparatus. In cases where we have to break down strong adhesions within a joint, to correct the temporary anchylosis then existing, it is needful to make provision for replacing the limb once more in its faulty position as soon as the operation is accomplished, and before the patient recovers from the chloroform; so that although the adhesions within the joint have been broken down and for a time destroyed, those parts of the cartilages which, up to the moment of the operation, had been opposed to each other shall still retain their relative position, and after the subsidence of the more acute symptoms, resulting from the extension, we can, by gradual measures, secure a proper play to the articulation. In this plan, it is needless to say, I follow Mr. Barwell's suggestion, always before the joint is moved under chloroform, to take a cast in gutta percha of the peculiar angle and form in which the joint then lies, so as to be able to replace it exactly in its unnatural position immediately afterwards, allowing it to rest there, with soothing treatment for a few days, before the secondary and more perfect extension is attempted. Besides the emollient applications already referred to, I have found great advantage, in all the more acute stages of articular disease, by the use of the vesicating collodium (Smith's green fluid) painted over different parts of the joint, especially over the well-known favourite seats of pain; not in large patches, but small ones frequently repeated. This mode of treating joints is well known to be very serviceable in acute rheumatic arthritis, and it is not less so in many of the other varieties. Very rarely, if ever, do I apply leeches to the surface of an inflamed joint, but frequently, on the cessation of the acute symptoms, and where there is much thickening of the tissues around the joint, I have encased it in Scot's ointment or in a strong solution of iodide of potassium, in water and glycerine. With regard to injuries of the joints and their subsequent effects, I have, in making these reports, noticed this curious circumstance, that where any joint has been injured by a twist or wrench and the ill effects are immediate, they will the more quickly cease, and a perfect recovery result, than if an interval elapse in which little pain is felt, although not an entire absence of it, and then, perhaps on account of the time which has passed since the injury, more serious lameness of the joint becomes apparent. The former class of cases, in which the symptoms quickly show themselves, are possibly in subjects who possess a robust and vigorous constitution, in whom the symptoms pass away as rapidly as they come, and recovery soon follows, whilst in the languid, leuco-phlegmatic, and weak, it is some time ere the storm shows itself, and still longer before it runs through all its phases, and subsides entirely.

The joints which I have excised (Sub-class C, Table XIV) are the elbow and the knee; four of the former and three of the latter, including one case of death. I have also removed the entire astragalus in a case of compound disocation at the ankle-joint. In this case the gentleman, who was for a time an in-patient of the hospital, made an excellent recovery, and now, after an interval of nearly three years, walks so well that it is sometimes difficult to tell in which foot the tarsus has six instead of seven bones. In my cases of excision of the elbow the results have been all that could be desired, the limbs so preserved being extremely useful. In one case, within twelve months after the operation, the man could lift a considerable weight, and push before him a barrow pretty heavily laden; in another, a woman was able to gain her livelihood by needlework, whilst in the other two cases the joints were perfectly useful, except that in one there was a little locking in the movements of supination of the hand, as if the portion of the neck of the radius still left did not rotate freely in its bed.

The first of these excisions gave me much anxiety for a time, for I discovered, within a day or two after the operation, that the woman had lost sensation in both sides of the little finger, but retained it perfectly in the ulna side of the ring finger. From this I concluded that at the time of the operation I had notched and injured the ulnar nerve, but, fortunately, not so as to cause entire paralysis. This slowly recovered itself, and in three or four months sensation returned, in some degree, on both sides of the little finger, and at the end of twelve months she could feel very plainly with it, although with a certain persistent feeling of numbness and weight, the only defect that remained being a difficulty in raising and extending the ring and little fingers. This is the case of the woman who afterwards earned her livelihood by her needle.

Of the three cases of excision of the knee one has already been commented on, *in extenso,* in the first volume of these Reports; the young man is now in excellent health, and I heard only a few weeks since that he frequently walks six and sometimes eight miles a day with a good serviceable limb, firmly anchylosed in the original position of the incision. Another case, in a woman, has gone on exceedingly well; the last I heard of her was that she was cleaning the deck of a canal barge with a broom, and working with all the energy of a man. But one case I lost, and in this there was something to be learnt in connection with the preparations which ought to be attended to before any important operation; the patient died sixteen days after it, not from any mischief in the joint itself, but in consequence of an immense abscess, which had formed on the left side of the

Table XIV.

Class III.—C. Excisions of Joints.

Part operated on.	Under 10 years.		Under 20 years.		Under 40 years.		Under 60 years.		Over 60 years.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
a. Elbow	......	......	......	......	1 ...	2 ...	1 ...	......	......	......	2 ...	2 ...
b. Knee	......	......	1 ...	......	......	1 1	......	......	......	......	1 ...	1 1
c. Astragulus	......	......	......	......	......	......	1 ...	......	......	......	1 ...	......
	......	......	1 ...	......	1 ...	3 1	2 ...	......	......	......	4 ...	3 1
											8	

pelvis as the result of a troublesome fistula in ano, which had long existed, but of which, at the time, I had no knowledge; perhaps, it may be said, because, in my inquiries as to her previous health, I had not gone with sufficient minuteness into the history of her case. The abscess was very large and occasioned a great deal of constitutional irritation for several days, the exact cause of which I could not account for, till my attention was directed to the painful condition of one labium, and the side of the perinæum opposite to that on which the operation had been performed. I opened the abscess and let out a large quantity of fœtid matter, but she sank within forty-eight hours afterwards. In the two recoveries after excision of the knee the limb was placed in an immoveable apparatus, upon the plan suggested by Dr. Patrick Heron Watson, and I had every reason to be satisfied with the system which he adopts, for it is the greatest possible comfort for the patient to feel that those portions of the limb which meet at the site of the excision are kept perfectly steady, and that there is no chance of the ends of the bones being displaced; whilst he can be easily and painlessly moved in bed, the limb being slung in a cradle support. In the case that died the limb was put up in one of the straight (M'Intyre's) splints, and for some days before

I detected the perineal abscess I thought the pain of which the patient complained when attempting to move the body was from some disturbances of the parts at the knee. In two other cases which have been under my care in the hospital since these reports were closed, I have kept to Dr. Watson's method, and with excellent success. All these cases of excision were treated as strictly upon antiseptic principles as the advance of the system at the time suggested.

The next Sub-class (D, Table XV) contains injuries to the joints in the way of sprains. It is difficult, perhaps, to give a very correct description of the structural changes which take place in what are popularly called sprains, near to joints, but I am inclined to think that in most cases, at any rate, there is some laceration and consequent disintegration of tissue, either muscular, tendinous, or ligamentous. Some years ago I had an opportunity of seeing the changes in muscular tissue, which result from sprains near joints in the lower animals; a wholesale butcher showed me a few carcases of beasts in which some of the more expensive cuts had to be sacrificed on account of injuries which the animals had received from sudden sprains, whilst being driven along the then rough pavement of the crowded streets of our city. If we consider how such animals as sheep and oxen are accustomed to soft pastures with impressible soil, it will be seen how the unyielding surfaces and stones of our roads must interfere with their ordinary habits of locomotion. Hence it is that in traversing our streets they are apt to suffer sundry sprains and injuries, and so in these cases there had been invariably a distinct laceration of many fibres or bundles of fibres of fleshy tissue near to the hip-joints, chiefly in the locality of what would be the adductor muscles, as if every now and then in trotting along the animal had suddenly straddled or separated its legs over the slippery stones, and thus torn the fleshy tissue of certain muscles. In these places I always found an effusion of clotted blood, and was told by the butcher that this quickly putrefied when the beast was cut up, and the meat in these parts soon became so bad that it could not be offered for sale. With this view of what sprains may possibly be we can

TABLE XV.

CLASS III.—D. Sprains near Joints.

Part operated on.	Under 10 years.		Under 20 years.		Under 40 years.		Under 60 years.		Over 60 years.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
a. Wrist and hand					1						1	
b. Knee						1	1				1	1
c. Ankle and foot			6	1	5	4	2	1	1		14	6
					2						2	
			6	1	6	5	3	1	1		16	7
					2						2	
											18	7
											25	

infer, I think, what are likely to be the best means of treatment. Rest must form one element, and time another, in order to permit of the slow absorption of the effused blood and the deposition of some new fibrinous matter, which shall act as a connecting medium between the ruptured fibres. The common way of treating sprains is to apply very early stimulating liniments of hartshorn and oil, and suchlike matters, to the surface of the injured joint, under the idea of preventing the stiffness and pain which might arise. But my plan in sprains near to joints has always been to use the emollient treatment before described for diseases of joints themselves, and to do this either by hot fomentations or wetted lint with oil-silk covering, for at least a few days after the injury, and then to commence, and not till then, the application of something to the surface which may stimulate the absorption of the coagulated material and yet not interfere with the healthy deposit of new matter. I find nothing answers so well as a solution of iodide of potassium in weak alcohol and water, with a little glycerine. This is an excellent lotion, and may be applied in these circumstances on folded lint, without any other covering than a porous bandage, for as soon as the lint has been in contact with the body for a short time the spirit and water evaporate, and the glycerine remains, holding the crystals of the potash salt in suspension; these are very easily absorbed through the skin, forming a far less painful application, yet equally efficient, than the tincture of iodine, which often blisters and cracks the skin. The only other remark I have to make about sprains is, that the large majority were near the ankle-joint. Twenty-two are so recorded, two of which occurred whilst the subjects of the injury were in a state of alcoholic unconsciousness.

Following closely upon sprains are those curious affections of joints which may be classified as inflamed tendons and thecæ (Sub-class E, Table XVI); they frequently occur near the ankle, and not unusually along the line of the tendo Achillis, and in one case I had distinct evidence of the presence of effusion into the sheath of the tendons, producing a distinctly fluctuating tumour on each side of it. Rest to the joint, emollent applications, then counter irritation by the vesicating collodion, and then, if needful, strapping and bandaging to excite absorption by pressure and to keep the tendon from moving in its sheath, have, in each case, led to successful results. Among this class of cases was one of the most curious I have ever seen. It was in a man, by trade a tailor, about fifty years of age, who came into the infirmary with some injury to the right knee-joint, received, he said, about sixteen weeks previously, from the kick of a horse. Being lame from this cause, his left knee was twisted about eight weeks previously in some unaccountable way; this had caused a rupture of the tendon just above the patella, leaving a space in which at least two fingers could be placed, and giving the left knee the appearance of paralysis. A careful examination of the right knee showed that what he thought to have been the result of a kick was really the same kind of injury, namely, rupture of the common tendon of the extensor muscles, so that when he came into the hospital he could neither stand nor walk without assistance, and was as if the subject of complete paraplegia.

TABLE XVI.

CLASS III.—E. Inflamed Tendons and Thecæ.

Near to—	Under 10 years.		Under 20 years.		Under 40 years.		Under 60 years.		Over 60 years.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
a. Wrist and hand ...	...	...	...	...	...	1	...	...	...	...	...	1
b. Knee	...	...	...	...	1	...	...	...	...	...	1	...
c. Ankle and foot ...	1	...	1	...	3	...	...	...	...	...	5	...
	1	...	1	...	4	1	...	...	...	...	6	1
											7	

I made careful inquiries as to his previous history to see if there was any peculiar diathesis, in the way of syphilitic poison or rheumatic tendency, but this I could not discover. There had been no abrasion or rupture of the skin on the part, either when he was kicked by the horse or when the left foot was twisted. The case was too clear to lead to any obscurity of diagnosis, there was nothing wrong in the joints themselves, and the only question was as to the best plan to be devised for his relief. Mr. Wood, of this city (our instrument maker), very ingeniously contrived an apparatus for the knees, which by means of a short lever on each side of the joint, connected by a cross-piece, could be pulled up by an elastic india-rubber spring, such as Mr. Burwell employs for club feet, only on a larger scale, and this arrangement so far supplemented the lost power of the extensor muscles that the patient, to his great delight, could stand erect and walk firmly almost as soon as the apparatus was adjusted. I watched the case for some time, and although it seemed as if the space between the ends of the ruptured tendons diminished slightly, there still remained a permanent depression and loss of muscular tissue.

In the next sub-class are placed those cases of enlarged bursæ near the joints, which I have had to treat. It will be noted in Table XVII that out of nine cases seven were near to the knee-joint, one at the elbow, and one near the ankle. Of those near the knee, six were in the usual position, being enlargements of the subcutaneous bursa, which is, in my opinion, erroneously spoken of as a bursa patellæ, whereas its true situation should entitle it to the cognomen of *bursa ligamenti patellæ,* as it is far more frequently found over the ligament than upon the patella itself. In one of these cases the enlarged bursa was of immense size; it occurred in a woman aged thirty, and was of such magnitude that when tapped with the trochar and canula nearly fourteen ounces of fluid of a coffee-ground colour, and specific gravity of 1·027, were taken out; I then injected nearly the same quantity of a solution of tincture of iodine and water, in the proportion of one to twelve; this was retained for five minutes and then drawn off. Before withdrawing the canula a brass wire spiral drain-tube was introduced, and allowed to remain in the sac of the bursa for eight days, it was then removed, the knee carefully strapped and bandaged, and an excellent recovery followed. Another case was at the back of the knee-joint, and although I have seen others in a similar position they are not recorded in these reports. This case seemed to be connected with the tendon of the semi-membranous muscle, and occurred in a little girl aged eight. When tapped I drew off two drachms of clear amber-coloured fluid, and injected about the same quantity of undiluted compound tincture of iodine, placed the limb in a splint and kept it so for several days. A certain degree of suppuration was set up, with some irritative fever, which for a time delayed the cure, but in about five weeks afterwards she went out perfectly well. It has often occurred to me that cases of enlarged bursæ in the popliteal space might simulate the character of aneurism, for although there would be absence of expansile pulsation, yet there might be transmitted pulsation and an *arterial bruit* from pressure on the vessels, and some little care would be needed to render the diagnosis quite certain. The distinction between chronic abscess and enlarged bursa is not quite so easy; one sign which I think valuable is, that in a case of abscess in the

TABLE XVII.

CLASS III.—F. Bursæ near Joints.

Near to—	Under 10 years.		Under 20 years.		Under 40 years.		Under 60 years.		Over 60 years.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
a. Elbow	...	...	...	...	1	...	...	...	...	...	1	...
b. Knee	...	1	...	3	...	3	...	...	...	...	...	7
c. Ankle and foot ...	...	...	...	...	...	...	...	...	1	...	1	...
	...	1	...	3	1	3	...	...	1	...	2	7
											9	

popliteal space, as the swelling increases it assumes an acuminated form, and becomes more or less conical at some part, until a tendency to burst gradually becomes apparent. This, however, in the cases I have seen, never takes place in enlarged bursæ, but so long as the tumour increases in size it still preserves its hemispherical or nearly globular outline, stretching the tissues which cover it in a very equable manner. In acute cases, near the elbow, which often result from sudden blows on the olecranon, and very frequently produce great inflammation of the surrounding parts, seeming to implicate the joint itself, the diagnosis for a time is often obscure. But these swellings have very little tendency, if any, to point, or to burst spontaneously, and they generally present a flattened, though somewhat globular form.

The enlarged bursa in the foot, which I have recorded, must be accounted an aggravated form of bunion, and, indeed, as the late Mr. Aston Key used to teach, a bunion on the great toe is very generally an enlarged bursa near to the internal lateral ligament, arising from displacement of the phalanx, and rupture or distension of the neighbouring tissues.

In the next Sub-class (G, Table XVIII) I have placed the only case of loose cartilage in a joint which has come under my observation. This was a well-marked example in the knee, and it was possible, occasionally, when the joint was flexed to a certain degree, to feel the cartilage very distinctly, and to move it about on one side of the ligamentum patellæ; unfortunately, when everything was arranged for its removal, the man took fright, and on the morning of the day fixed for the operation he left the hospital.

In the last Sub-class (H, Table XIX) are recorded the cases of talipes. They are only two, for in these, as in similar affections of the joints in young children, the greater number of those coming to our infirmary are treated as out-patients. These, however, were from a distance, and in one case the deformity existed in both feet; they were both talipes varus, and were treated at first with the tin splint suggested by Dr. Porter, of Dublin, as a means of fixing the heel as well as the sole, and gradually everting the foot by drawing the upright portion of the splint towards the calf of the leg. After a short interval I applied Mr. Barwell's system of elastic bands, in each case with excellent results. While they remained under observation in the single case and in one foot of the double case the feet became perfectly natural in form and movement, but as in the latter the child was not brought regularly to the hospital on account of illness, I fear it has not turned out permanently successful.

TABLE XVIII.

CLASS III.—G. Loose Cartilages in Joints.

Loose cartilages in—	Under 10 years.		Under 20 years.		Under 40 years.		Under 60 years.		Over 60 years.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
a. Knee-joint	...	...	...	...	...	...	1	...	...	...	1	...

TABLE XIX.

CLASS III.—H. Talipes.

Talipes.	Under 10 years.		Under 20 years.		Under 40 years.		Under 60 years.		Over 60 years.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
a. T. Varus—Right...	...	1	...	...	...	...	...	...	...	...	...	1
b. „ Duplex	1	...	...	...	...	...	...	...	...	...	1	...
	1	1	...	...	...	...	...	...	...	...	1	1
											2	

CLASS IV.—*Dislocations, &c.*

We now enter upon the consideration of the fourth group of cases, which I have arranged as A (dislocations) and B (fractures). Under the first of these I have only five cases to report, two of the shoulder, one of the elbow, and two of the hip. The reason why dislocations of the shoulder appear in such small numbers in these returns is, that they are almost invariably treated in the accident room, or as out-patients. Only one of the two cases here mentioned requires any special comment; it was that of a man aged 63 years, who had dislocated his left shoulder fourteen days previously, and in whom, after the most persevering attempts, I was unable to reduce it, even when the patient was placed under chloroform and all the processes of manipulation resorted to. Two attempts were made, the second in the presence of our consultation, when I had the assistance of the late Mr. Dumville, who, as is well known, took great interest in such cases, and by whose advice no further efforts were made to reduce the bone. The age of the man, and the possibility of injuring some of the more important tissues in the axilla, especially the artery, which was somewhat *atheromatous*, determined me to accept his opinion.

Possibly, in this case, the cause of the difficulty in the reduction may have been due to some unusual position of the head of the bone, in reference to the rent of the capsule which took place at the time of the accident, for it is noted as a sub-coracoid dislocation. In this, as in many other cases of injury to the shoulder-joint from acute inflammation, anchylosis, and other changes, I have had an opportunity of observing how wonderfully motion in the shoulder may be acquired by the muscles which move the scapula acting afterwards more powerfully than before the accident, without any change in the relation of the head of the humerus to the glenoid cavity. Of the two cases of dislocation of the hip, one was easily reduced by the manipulation method, whilst under chloroform; the other, which, from the shortening, and eversion of the foot, seemed when first admitted, exactly like a case of fracture of the neck of the thigh-bone turned out to be, on more careful examination, a case of dislocation of the head of the thigh-bone on to the pubes. This was reduced by manipulation after some trouble, but not until the head of the thigh-bone had been displaced into the *obturator foramen*, and then into the sciatic notch, whence at last it was dislodged from this false position forwards and inwards into the acetabulum.

We now come to the examples of simple fractures (Class IV, B, *a*), which in number, as might be expected, are very considerable. But still we have a paucity of cases of fracture in the upper as compared with those in the lower extremities, on account of the former being so generally treated as accident-room patients.

In Table XXI I have arranged the simple fractures in such a way as to show the number which have occurred to the different bones in each of the five periods of life, into which the majority of these tables are divided, and further indicated by separate rows on which side of the body each particular fracture had occurred, and in the last two columns the total number on each side. From this we learn how much more prone certain fractures are to occur at special periods of life; it seems, for instance, that infancy and old age are most liable to simple fractures of the thigh, in the former the length of leverage in the femur disposing it to snap

TABLE XX.

CLASS IV.—A. Dislocations.

Articulations.	Under 10 years.		Under 20 years.		Under 40 years.		Under 60 years.		Over 60 years.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
a. Shoulder	...	...	...	...	1	...	...	...	1	...	2	...
b. Elbow	...	...	...	...	...	...	1	...	...	...	1	...
c. Hip	...	...	...	...	...	...	1	1	...	...	1	1
	...	...	...	...	1	...	2	1	1	...	4	1
											5	

TABLE XXI.

CLASS IV.—B. Fractures.—*a.* Simple.

Part.	Under 10 years.		Under 20 years.		Under 40 years.		Under 60 years.		Over 60 years.		Total.		Side.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	R.	L.
Face ....R.	1	...	2	...	...	...	...	...	...	...	3	...	3	...
	...	...	...	...	...	...	...	...	...	...	...	...		
„ ....L.	...	...	1	1	...	...	...	...	...	...	1	1	...	2
	...	...	...	...	...	...	...	...	...	...	...	...		
Clavicle ....R.	...	...	...	...	1	...	2	...	...	...	3	...	3	...
	...	...	...	...	...	...	...	...	...	...	...	...		
„ ....L.	...	...	...	1	...	...	...	...	...	...	...	1	...	1
	...	...	...	...	...	...	...	...	...	...	...	...		
Humerus............R.	1	...	1	...	...	...	1	...	1	...	4	...	4	...
	...	...	...	...	...	...	...	...	...	...	...	...		
„ ....L.	...	...	1	...	1	...	...	...	...	1	2	1	...	4
	...	...	...	...	...	...	1	...	...	...	1	...		
Ulna ....R.	...	...	1	...	...	...	1	...	...	...	2	...	2	...
	...	...	...	...	...	...	...	...	...	...	...	...		
„ ....L.	...	...	1	...	...	...	...	...	...	...	1	...	...	1
	...	...	...	...	...	...	...	...	...	...	...	...		
Radius..............R.	...	...	1	...	...	...	...	...	...	...	1	...	1	...
	...	...	...	...	...	...	...	...	...	...	...	...		
„ ....L.	...	...	2	...	...	...	...	...	...	...	2	...	...	2
	...	...	...	...	...	...	...	...	...	...	...	...		
Ulna and Radius...R.	1	...	1	...	...	...	...	...	1	...	3	...	3	...
	...	...	...	...	...	...	...	...	...	...	...	...		
„ „ ..L.	...	...	3	...	...	...	...	...	...	...	3	...	...	3
	...	...	...	...	...	...	...	...	...	...	...	...		
Hand ....L.	...	...	...	...	1	...	...	...	...	...	1	...	...	1
	...	...	...	...	...	...	...	...	...	...	...	...		
Ribs................R.	...	...	1	...	3	...	3	...	1	...	8	...	9	...
	...	...	...	...	...	...	1	...	...	...	1	..		

Part.	Under 10 years.		Under 20 years.		Under 40 years.		Under 60 years.		Over 60 years.		Total.		Side.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	R.	L.
Ribs..................L.	...	...	2	...	2	...	1	...	...	...	5	...	...	5
	...	...	...	...	...	...	...	...	...	...	...	...		
Pelvis	...	...	...	...	...	...	1	...	...	...	1	...	1	...
	...	...	...	...	...	...	...	...	...	...	...	...		
Femur...............R.	10	5	8	...	2	...	5	...	4	3	29	8	37	...
	...	...	...	...	...	...	...	...	...	...	...	...		
„ ....L.	6	2	10	1	1	...	3	...	2	2	22	5	...	30
	...	...	...	...	1	...	2	...	...	...	3	...		
Patella..............R.	...	...	...	...	...	...	...	...	1	...	1	...	1	...
	...	...	...	...	...	...	...	...	...	...	...	...		
„ ....L.	...	...	1	...	...	...	2	...	...	...	3	...	...	3
	...	...	...	...	...	...	...	...	...	...	...	...		
Tibia ....R.	2	...	2	...	4	...	5	2	1	...	14	2	18	...
	...	...	...	...	1	...	1	...	...	...	2	...		
„ ....L.	2	...	2	1	2	1	3	...	1	...	10	2	...	12
	...	...	...	...	...	...	...	...	...	...	...	...		
Fibula..............R.	1	...	5	...	7	...	2	4	1	...	16	4	20	...
	...	...	...	...	...	...	...	...	...	...	...	...		
„ ....L.	...	...	7	1	3	2	7	3	1	1	18	7	...	26
	...	...	...	...	...	1	...	...	...	...	...	1		
Tibia and Fibula...R.	1	1	9	1	7	...	10	5	2	...	29	7	43	...
	...	...	2	...	2	...	1	2	...	...	5	2		
„ „ ...L.	1	...	6	...	6	1	1	1	1	...	15	2	...	21
	...	...	...	...	1	...	3	...	...	...	4	...		
Foot..................R.	...	1	1	...	...	...	...	...	...	...	1	1	2	...
	...	...	...	...	...	...	...	...	...	...	...	...		
„ ....L.	...	...	...	...	...	...	1	...	...	...	1	...	...	1
	...	...	...	...	...	...	...	...	...	...	...	...		
	26	9	68	6	40	4	48	15	17	7	199	41	147	112
	...	...	2	...	5	1	9	2	...	...	16	3		
											215	44=	259	

under sudden strain, often in the centre; whereas in the latter the fracture occurs most frequently at the upper part, near to the neck of the bone. In fractures of the leg it will be seen that a large number of them involve both bones, but when only one bone is broken it is oftener the fibula than the tibia. The total number of cases of simple fracture are 259, of which 215 occurred in males, and 44 in females, the proportionate number of the cases being very nearly the same at each period of life.

As to the mode of treatment, I have not much to tell. In the thigh the long splint has been almost invariably employed, and the double inclined plane quite the exception. I have tried in two of the cases—one in an old man aged seventy-eight, and the other in a child—Professor Syme's method of using the long splint folded in a sheet wrapped entirely round the limb, but it has appeared to me that, with the class of patients we have to treat in hospital practice, this method has some disadvantages, chiefly in point of cleanliness, and, therefore, I prefer the simple long splint with perineal strap, and, if necessary, the additional use of weight-extension, as in diseases of the hip-joint. In fractures of the ribs, which it will be seen are not very numerous, I have employed Mr. Hilton's plan of strapping only the injured side of the chest, and where the strips of plaster can be well applied and made sufficiently adhesive, it certainly is a most comfortable mode of treatment for the patient, and enables us to allow of much more movement in respiration than girthing the thorax with a roller bandage. In fractures of the leg, where the tibia was injured or both bones involved, I have used most generally the straight-back splint for the leg with sole piece for the foot, taking care to place the limb in that position which Sir James Paget has so well defined; "never to overlook the three points of contact in the foot, viz. the heel, the ball of the great toe, and the ball of the little toe, and see that they remain in their proper relation to the axis of the leg." Some of the cases, however, have been placed on the side and treated in the *semiflexed* position recommended by Mr. Pott, but there is this disadvantage in it (according to my experience), that unless great care be taken there is a tendency for the heel to be carried too far backwards, and to produce deformity after the union of the fracture. Side splints are placed where needful, and these I generally direct to be made of the split splints, or Gooch's splints, as they are usually called. In fractures of the leg Salter's swing splint and cradle have been used as often as possible. In fractures of both bones of the forearm, which, as the returns will show, have rarely been treated as in-patients, I have insisted at all times upon the importance of not allowing these fractures to remain fixed in the splint without movement for too long a time after the accident.

I believe many cases of permanent inability to pronate and supinate the hand after fractures of the bones of the forearm, are caused by the limb having been retained too long a time in one position, the bones being pressed by the bandages too much towards the middle line of the limb. This possible error may be prevented by always undoing such fractures at the end of the first week or ten days, and, if all be well, carefully replacing the splints. The position I prefer is, in every case, that which shall place the hand in a semi-prone posture, with the thumb directed upwards and the hand a little disposed to be bent downwards, being the same as in Colles's fracture of the radius, where the pistol splint is used; and this position slightly varied is a very good one, I believe, for fractures at any part of the double bones.

We now pass on to the more important injuries of compound fractures (Class IV, B, *b*, Table XXII),* in which I have to report forty-five cases.

Of these, five died, one, a case of compound fracture of the thigh in a child five years of age, twenty-one hours after the receipt of the injury; another, a case of compound fracture of the leg in a man aged fifty-six, four days after the accident. A similar injury, attended with epileptic fits, terminated fatally in twenty-three days. In the fourth case, a compound fracture of the thigh, the patient died thirty days after the injury, amputation not being permitted; and the fifth, a very tedious case, in which a woman aged twenty-four with a compound fracture of both bones of the leg near the ankle, caused by jumping out of a window, was under treatment for more than eight months, during the latter part of which time she showed symptoms of rapid phthisis, she, however, repeatedly declined to consent to amputation, although, uncertain as the result would have been, it was the only possible means of saving her life. All the other cases, forty in number, made good recoveries, and with the exception of some secondary abscesses which occurred in bruised tissue along the lines of tendons, or as a consequence of cellulo-membraneous

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* All the bones indicated in this table were the subject of compound fracture, except those marked in italics, and these were *not* in communication with the external wound.

TABLE XXII.

CLASS **IV.**—**B.** Fractures.—*b.* Compound.

No.	Initials.	Age.	Sex.	Part.	Side.	Cause.	Re-sult.	Days in hosp.	Mode of treatment of wound.
1	J. B.	19	M.	Tibia, *Fibula*	L.	Coal tub in mine	Rec.	93	Lister.
2	W. B.	38	M.	Tibia, *Fibula*	R.	Drunk, run over	Rec.	85	Carb. oil.
3	M. B.	30	M.	Malar bone	R.	Fall of seven feet	Rec.	9	Carb. lotion.
4	J. B.	21	M.	Tibia, *Fibula*	L.	Fall	Rec.	99	Lister.
5	T. B.	43	M.	Humerus, near elbow	R.	Railway	Rec.	26	Lister.
6	R. B.	32	M.	Tibia, Fibula	L.	Iron weight	Rec.	66	Carb. oil.
7	M. B.	24	F.	Tibia, *Fibula*	L.	Fall fm. window	Died	253	Lister, phth.
8	H. B.	48	M.	Tibia	R.	Drunk, fall	Rec.	70	Carb. oil.
9	D. C.	38	M.	Skull	...	Fall	Rec.	12	Carb. lotion.
10	E. H. C.	32	F.	Tibia, *Fibula*	R.	Epileptic, fall	Died	23	Carb. oil.
11	J. C.	11	M.	Tibia, *Fibula*	L.	Run over	Rec.	25	Cerecloth.
12	T. C,	14	M.	Humerus	L.	Machinery	Rec.	116	Carb. oil.
13	G. D.	25	M.	*Ulna*, Radius	R.	Fall	Rec.	7	Lister.
14	J. W. D.	18	M.	Tibia, *Fibula*	L.	Barrel of goods	Rec.	56	Lister.
15	H. D.	29	M.	Mid. Femur	R.	Cart wheel	Rec.	54	Cerecloth.
16	E. D.	11	M.	Ulna, Radius	L.	Fall	Rec.	11	Cerecloth.
17	G. D.	19	M.	Tibia, *Fibula*	L.	Cart wheel	Rec.	87	Lister.
18	T. D.	16	M.	Tibia, *Fibula*	L.	Machinery	Rec.	61	Carb. oil.
19	R. G.	30	M.	Condyle, Humerus	L.	Fall	Rec.	70	Lister, lac.
20	W. G.	3	M.	Tibia, *Fibula*	L.	Crushed by flag-stones	Rec.	51	Lister, lac.
21	W. G.	25	M.	Tibia, Fibula	R.	Kicked by horse	Rec.	44	Lister, lac.
22	J. H.	30	M.	Lower 4th Femur	L.	Fall from 'bus	Died	30	Carb. oil.
23	H. H.	20	M.	Tibia, Fibula	L.	Bale of goods	Rec.	82	Carb. oil.
24	J. H.	23	M.	Lower jaw	R.	Epileptic, fall against iron bar	Rec.	22	Dry lint.
25	R. H.	39	M.	Mid. Humerus	R.	Fall in coal-pit	Rec.	12	Carb. oil.
26	J. J.	48	M.	Tibia, Fibula	R.	Fall in wrestling	Rec.	65	Carb. oil.
27	J. J.	44	M.	Tibia, Fibula	L.	Blow from flag-stone	Rec.	54	Lister, muslin.
28	M. K.	5	M.	Mid. Femur	R.	Run over	Died	21 h.	Carb. oil.
29	E. L.	48	M.	Tibia, *Fibula*	L.	Drunk, cart wheel	Rec.	121	Lister, lac.
30	J. L.	60	M.	Tibia, *Fibula*	L.	Fall of building	Rec.	96	Lister, musl.
31	J. L.	65	M.	Ext. Condyle, Humerus	R.	Fall	Rec.	53	Lister.
32	J. M.	52	M.	Tibia, *Fibula*	L.	Kicked in wrestling	Rec.	39	Cerecloth.
33	J. M.	39	M.	Nasal-bone	...	Kick	Rec.	35	Carb. lotion.
34	P. M.	38	M.	Tibia, *Fibula*	R.	Fall	Rec.	41	Cerecloth.
35	P. P.	36	M.	Tibia, Fibula	L.	Iron plate	Rec.	57	Lister, musl.
36	W. P.	24	M.	Tibia, *Fibula*	L.	Fall	Rec.	95	Lister, musl.
37	A. R.	38	M.	Fingers	R.	Brick wall	Rec.	3	Cerecloth.
38	J. R.	30	M.	Tibia, *Fibula*	R.	Drunk, fall	Rec.	40	Cerecloth.
39	J. S.	33	M.	Tibia, *Fibula*	L.	Fall	Rec.	147	Lister, lac.
40	G. S.	56	M.	Tibia, *Fibula*	L.	Fall	Rec.	15	Lister, musl.
41	C. S.	21	M.	Tibia, Fibula	R.	Cart wheel	Rec.	41	Cerecloth.
42	J. S.	56	M.	Tibia, Fibula	R.	Inj. to head, fall	Died	4	Carb. oil.
43	R. S.	48	M.	Tibia	R.	Fall, 35 feet	Rec.	64	Cerecloth.
44	W. S.	22	M.	Tibia, *Fibula*	R.	Fall in mine	Rec.	67	Lister, musl.
45	C. W.	11	F.	Tibia, *Fibula*	L.	Kicked by horse	Rec.	27	Cerecloth.

inflammation, they all recovered in the periods of time indicated in the table.

It is impossible to arrive at an average of the number of days occupied by these cases, inasmuch as we cannot describe the exact peculiarities of each, either as to the intensity of the injury or the special powers of repair of each individual constitution. They were all treated upon antiseptic principles, even from the earliest cases here mentioned; the exact method, as far as it could be explained here, is indicated in the last column of the table, Lister's being the prevailing one, and the particular modifications of it being the use of the carbolised oil, lac plaster, and cerecloth, and in a few cases the watery solution of carbolic acid only. No cases of injury have seemed to show so well the good effects of the antiseptic method as compound fractures. Surgeons, from their earliest experience, must always have felt the great uncertainty of these cases, not only as to probable duration of treatment, but also as to the effects upon the constitution. If we seek for a reason we have not far to look; to produce a compound fracture the injury must be so intense as to disintegrate, not only the bony structures of the part, but also the softer tissue must suffer in proportion. With the injury to the bone a portion of the periosteum will certainly be detached, and with it the nutrition of the bone will suffer, and most likely death of the part result. A piece of bone thus dead, lying like a foreign body at the bottom of the wound, will permit the excretions of the part to rest in its porous tissue, there to undergo those same chemical changes which they would do if truly *extra corpus,* under similar conditions of heat, moisture, exposure to air, and tendency to putrefy. Thus it is hardly possible to treat a case of compound fracture with an extensive external wound, without having evidence of septic changes. It is to prevent these that our efforts should be directed, either by simply covering the wound by any means which may be found certainly efficacious, or, if this be not possible, by the use of such remedies as experience has shown will avert putrefaction, and some test should be employed to warn us of the approach of this condition. It is useless to wait until we have the grosser signs of its presence, in the fetid smell of the noxious exhalations from the wound; precautionary measures should be commenced at the earliest possible moment of the treatment, to anticipate and prevent these changes, for it is an axiom in the antiseptic treatment that "it is easier to prevent the advent of putrefaction than to arrest its progress when once established." The absence of constitutional irritation in all the above cases has attracted not only my attention, but also that of all who have watched the daily progress of them with me in our wards, and if it were only on this account, that compound fractures treated upon antiseptic principles lose their constitutional character, and become resolved into completely local injuries, then, I think, those who have watched such cases treated upon these principles should feel it a duty to advocate them, if not with more earnestness, possibly with greater weight and authority, than I can boast.

One of the greatest compliments ever paid to the utility of the antiseptic method of treating wounds, by an eminent modern surgeon, is to be found in some remarks by Mr. Cooper Forster in his "Surgical Clinical Records," published in the 'Guy's Hospital Reports,' vol. xviii, p. 102, 1873, where he says—"But yet, though nothing definite can be fixed upon in its favour, I think, if I should happen to be the subject of a compound fracture, I should like my case treated by Mr. Lister's plan." What could the most ardent admirer of antiseptic surgery wish for more than such testimony as this, and from such a source?

When the wounds resulting from a compound fracture, have so nearly cicatrised, as to leave on the surface only a portion of unhealed tissue less than half a square inch in extent, I have had recourse to the use of what I have already called the *burn ointment,* and find it an excellent application, even when there is reason to suspect that the wound, in any way, communicates by sinus with a portion of dead bone which must be exfoliated.

On referring to the table, it will be seen that these injuries have occurred chiefly in middle life, between the twentieth and fortieth year, in which period the subjects of them would be exposed to the greatest amount of risk in following their laborious occupations; and it will also be noted how small a proportion of these severe cases have occurred to women as compared with men; out of the forty-five cases there having been only three in females.

In Class V, are the cases of injuries and diseases of the blood-vessels; A. arteries, B. veins, as in Table XXIII.

TABLE XXIII.

CLASS V.—A. Arteries.

	Under 10 years.		Under 20 years.		Under 40 years.		Under 60 years.		Over 60 years.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
a. Wounds of	1 ...	......	1 ...	......	4 ...	......	1 ...	......	......	......	7...	......
	......	......	......	......	1 ...	......	1 ...	......	......	......	2...	......
b. Atheroma of ...	......	......	......	......	......	......	1 ...	......	1 ...	......	2...	......
	......	......	......	......	......	......	......	......	......	......	......	......
c. Aneurisms	......	......	......	......	1 ...	......	... 1	......	......	......	1 1	......
	......	......	......	......	......	......	......	......	......	......	......	......
d. Lig. of femoral	......	......	......	......	1 ...	......	......	......	......	......	1...	......
	......	......	......	......	......	......	......	......	......	......	......	......
e. „ ext. iliac	......	......	......	......	......	......	1 ...	......	......	......	1...	......
	......	......	......	......	......	......	......	......	......	......	......	......
	1 ...	......	1 ...	......	6 ...	......	3 1	......	1 ...	......	12 1	......
	......	......	......	......	1 ...	......	1 ...	......	......	......	2...	......
											14 1	......
											15	

B. Veins.

	Under 10 years.		Under 20 years.		Under 40 years.		Under 60 years.		Over 60 years.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
a. Varicose, ligature	...	...	...	...	...	1	...	...	...	...	...	1
b. Varicocele, ligature	...	...	...	...	1	...	...	...	...	...	1	...
	...	...	...	...	1	1	...	...	...	...	1	1
											2	

Of the wounds of arteries, I have no special cases to relate, but only such as were treated on the general principle of tying both ends of the divided artery where possible. In aneurism, however, I have had four cases, in three of which a cure was effected, one of the popliteal by pressure, one by ligature, and one of the external iliac by ligature, besides one case of aneurism of the femoral in which the sac had burst before the patient was admitted into the hospital, and which proved fatal partly from the effect of shock, and partly from fatigue of a very long journey, which he had to undergo in coming here.

The case of popliteal aneurism cured by pressure, was in a man who then had a double aneurism, a large one on the right side, and a small one commencing on the left. In this case, after other means had failed, I used the three-pad tourniquet which I exhibited at the recent meeting of the British Medical Association in London, and since these reports were drawn up, this same patient has been under my care in the hospital, for the aneurism of the opposite popliteal artery, which has yielded to treatment by pressure of the same instrument. In the case of the ligature of the femoral and of the external iliac artery, the operations were conducted most carefully upon Mr. Lister's principles, and with excellent success; no pus being formed, and no trouble experienced in reference to the circulation in the limb, pain or inconvenience to the patient, or any signs whatever of secondary hæmorrhage. In diseases of the veins including varicocele which I have placed here, away from diseases of the testes, I have only had two cases, one of enlarged veins in the thigh and leg in a woman aged thirty-nine, who for many years had been working as a factory operative, and had suffered intensely from the pain attendant upon the distension of the vessels. I compressed the veins by means of hare-lip pins and twisted sutures, following very minutely the instructions given by Prof. Erichsen, so as not to transfix the veins themselves, or if this were done by accident to desist immediately from applying the ligature, and to select some other part of the vessel. The cure was perfect, and many months afterwards the woman had discovered no return whatever of the disease. In the varicocele an instrument was employed which I have used frequently in private practice for the same disorder, that is, the serre-nœud of M. Ricord, the ligatures being passed round the veins according to his method, and in this case, as in many others I have so treated, the most successful results have ensued. This method has been specially recommended within the last few years by Mr. Walter Coulson, and I can thoroughly endorse all he has said upon the facility and usefulness of this operation.

In Class VI, A (injuries to brain), I have had thirty-four cases, thirty-two males and two females; the preponderance of the former is what might be expected, the rougher sex being the more exposed to causes of injury. By referring to Table XXIV, it will be seen that four cases occurred as the result of drunkenness, one of which proved fatal. These injuries have varied considerably in intensity, from the slightest effects of concussion to those serious organic injuries which have been complicated with fracture of the skull. There is, however, only one which calls for special mention; it was undoubtedly a case of fracture of the base of the cranium, and during life the cerebro-spinal fluid escaped from one ear, it was collected in a small test-tube, to the amount of an ounce and a half, in about three hours, slightly stained with blood. When allowed to settle, and carefully examined, it was found to present several very interesting physical properties, one of which was, that, unlike to serum of the blood, for which it might have been mistaken, it was neutral or very feebly alkaline to test-paper, and only faintly coagulable by heat and nitric acid; but there were mixed with it some red globules of blood, and after the fluid so mixed had stood quiet for twelve hours it was visible to the naked eye that the red particles had separated and fallen to the bottom of the fluid, there presenting a remarkably bright crimson or nearly scarlet colour, and a distinctly spherical figure. From this I conclude that it may be fairly inferred that the fluid in which they were then placed was not only not *serum sanguinis*, but the *cerebro-spinal* fluid, which is of a less specific gravity; for, on the principles of endosmose, the lesser fluid would penetrate to the interior of the globules, which, like cherries in a bottle of brandy, would become distended, almost to bursting. This interesting experiment, therefore, performed for me by nature, proves, I think, that the density of the cerebro-spinal fluid is less than that of the *liquor sanguinis* itself. I regret that in this

TABLE XXIV.

CLASS **VI.—A.** Brain.

	Under 10 years.		Under 20 years.		Under 40 years.		Under 60 years.		Over 60 years.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
a. Concussion	8 ...	2 ...	2 ...	......	5 1	......	3 ...	......	1 ...	......	19 1	2 ...
	......	......	......	......	2 ...	......	1 1	......	......	......	3 1	......
b. Epileptic fits ...	......	......	......	......	......	......	2 ...	......	......	......	2...	......
	......	......	......	......	......	......	......	......	......	......	......	......
c. Fract. of skull...	......	......	1 1	......	... 3	......	... 1	......	......	......	1 5	......
	......	......	......	......	......	......	......	......	......	......	......	......
	8 ...	2 ...	3 1	......	5 4	......	5 1	......	1 ...	......	22 6	2 ...
	......	......	......	......	2 ...	......	1 1	......	......	......	3 1	......
											25 7	2 ...
											34	
B. Spinal Cord.												
a. Concussion........	......	......	1 ...	......	5...	......	......	......	......	......	6...	......
b. Paralysis	... 1	......	......	1 ...	2...	......	......	... 1	......	......	2 1	1 1
c. Fract. of Vertebra	......	......	......	......	... 2	......	... 1	.. ...	......	......	... 3	......
d. Diseased Vertebra	......	......	......	1 ...	......	......	......	......	......	......	......	1 ...
e. Tetanus	......	......	1 ...	......	1...	......	......	......	......	......	2...	......
f. Neuralgia and Neuromata ...	......	1 ...	......	......	2...	......	......	......	......	......	2...	1 ...
	... 1	1 ...	2 ...	2 ...	10 2	......	... 1	... 1	......	......	12 4	3 1
											20	

instance I did not test the fluid for the presence of sugar, which is said to have been found to be occasionally a constitutent.

In two cases, concussion followed falls occasoned by epileptic seizures; these were both in persons beyond the middle period of life.

The injuries to the spinal cord (B), as shown in the same table, were chiefly of the nature of concussion, of which there were six cases, three of fracture of the vertebræ, two in which tetanus occurred, and five in which paralysis followed the injury. In one of these, in a girl aged sixteen years, there were well-marked symptoms of injury to the spinal cord by direct violence caused by a punctured wound. My notes of the case are that, "in the middle of the night she was seen by a policeman to be ill-treated by a man with whom she lived, and who, it was afterwards found, had stabbed her with a penknife, in the back of the neck, about on a level with the seventh cervical vertebra, to the left side of its spinous process, the wound running about one inch and three quarters upwards and inwards. There was some hæmorrhage from the wound, which soon ceased."

She was brought into the hospital, and very shortly afterwards complained of a feeling of weakness and partial loss of power in the left arm and leg, but no loss of sensation. The wound was dressed with a pad of lint dipped in weak carbolic lotion, and in twenty-four hours the loss of power in the left limbs was more marked, but there was no loss of sensation whatever. On the third day the left pupil was observed to be smaller than the right, and that was the only additional change. On the sixth day the left pupil became dilated and there was observed distinct ptosis on that side, with a well-marked external strabismus. With these symptoms she seemed to have a little returning use of the left arm, and could, on the ninth day, almost close the left hand naturally. She then complained for the first time that her right side was numb, as far as sensation was concerned, but with perfect power of motion, and I found this was truly the case, not in the face, nor at all on the shoulder, but just up to the margin of the axilla and down the whole of the right side, nearly to the middle line in the abdomen. In three days after this, it is noted that "the loss of sensation extends along the whole of the right side, up as far as edge of anterior fold of axilla, no loss of sensation in the right arm nor in the upper surface of the shoulder on the right side of neck. Wound now healed, to all appearance as nearly as possible, except at the lower angle."

At the end of three weeks all these symptoms had gradually subsided, and as far as I could depend upon the testimony of the patient, and judging from my own observation, perfect sensation had returned on the right side. There was a little ptosis in the left eyelid, but the power of motion in the limbs of that side seemed to be completely regained. There can be no doubt, I think, that in this case the punctured wound had, in the first instance, implicated the anterior column of the cord on the left side in the cervical region, and the loss of motor power on the same side, with no loss of sensation, until some days afterwards, when the posterior columns were involved in the morbid changes, and the sensory disorder showed itself in the opposite side of the body, proved manifestly that the nerves of sensation decussate in the cord, as observed in the experiments of Brown-Séquard, affording, therefore, during life, an interesting pathological illustration in confirmation of the same. Most probably the later symptoms, which were caused by intra-cranial changes, were due to extension of irritation as far as the termination of the anterior column in the *crus cerebri*, near the region of the third nerve, with the ptosis and paralysis of nearly all the other motor muscles of the eyeball, except the external rectus. This may either have been produced by extension of the irritation from below upwards, from spinal cord to brain, or, more probably, to a certain degree, by pressure from effusion of blood or serum, the subsidence of the symptoms being afterwards brought about by its subsequent absorption.

Associated with this injury of the spinal cord, I may refer to a very curious case of persistent neuralgia in the heel which was present in the person of a man aged twenty-eight, who until four years previously had been a soldier in active service. He said he had sprained the heel about five years before he left the army, and he had, for nine years past, suffered the most intense pain in the lower surface of the left heel, for which he had been subjected, without benefit, to a great variety of treatment. On investigation it appeared as if the true source of the neuralgia was to be sought for in the condition of the spinal cord itself. He had received many injuries to the spine by falls from his horse and in other ways, and it seemed as if the intense pain in the heel which had always been treated as a local disease was an aberrant nervous impression caused by centric mischief. He was considerably benefited by the use of very large doses of quinine, the constant application of tincture of iodine, and then, after some weeks, the repeated use of small blisters over the lower portion of the lumbar region and the upper part of the sacrum. I gave him large quantities of the iodide of potassium, under the impression that there might be some syphilitie taint at work, but no special amelioration of the symptoms occurred whilst he was fairly under its influence. The quinine, rest, and counter-irritation were the most serviceable of any treatment he had received.

One case of tetanus which I have to report was benefited in a marked degree by the treatment I will now detail. He was a man, twenty-three years of age, whose foot had been crushed by some heavy body falling upon it, which had contused to an excessive degree all the soft tissues of the ungual phalanx of the great toe, and the index toe of the left foot, with fracture of both these bones. On the twenty-first day after the injury, when the fracture seemed to have united and the case appeared to be doing well, the parts having completely recovered their healthy appearance, he was suddenly seized with a feeling of coldness down the back, as if from rheumatic lumbago, and inability to open the mouth or protrude the tongue without difficulty, and, within a few hours, the abdominal muscles became tense and rigid. I then observed great hardness of the masseter muscles on each side of the face, and he was immediately placed under the following treatment:—To have hypodermic injections of a quarter of a grain of morphia into the leg of the injured side every six hours; to take 15 minims of the tincture of Indian hemp every two hours, and in twenty-four hours 12 oz. of brandy; tincture of opium one part with two parts of water to be applied constantly over the cicatrix on the toes. This treatment was uninterruptedly continued for eleven days, during which time the tetanic symptoms increased in severity for about three days, and then very gradually and completely subsided.

The other case of tetanus was in a man, aged eighteen years, and came on after a blow on the back of the head, received seventeen days before his admission into the infirmary; the wound, which had been two inches long, and passed across the occiput, appeared to be quite cicatrised with hard thickened cuticle over it. The patient was seized with very similar symptoms to those described in the last case. Precisely the same plan of treatment was pursued, only I find by my notes that the hypodermic injection of morphia was given every four hours, and the tincture of Indian hemp every three hours; an opiate lotion was applied to the back of the head over the cicatrix, which, when softened by moisture, showed that the cuticle was not perfectly entire and that the healing process had not been absolutely completed. On the third day of this treatment he had two sharp attacks of opisthotonos, and these recurred at intervals of sometimes four, and occasionally six, hours, for four days afterwards, yet deglutition was not materially interfered with, so that the remedies could be administered very regularly. After this, with one exception, on the ninth day, no further spasms occurred, and from the tenth to the eleventh day the stiffness of the neck, of the sides of the jaw and of the mouth ceased, and pursuing exactly this method of treatment he made a good recovery, leaving the hospital four weeks from the date of his admission.

We may conclude from these two cases, that in the management of tetanus occurring at the time of the healing of superficial wounds, it is necessary to support the nerve power of the body by the very free administration of alcohol, to soothe the irritable incident nerves of the injured part by local sedatives and the hypodermic use of morphia, and to bring about that peculiarly sustaining, yet calmative, effect which is attributable to the use of the Indian hemp, with as much nourishment in the way of the ordinary appliances of beef tea, milk, &c., as can be administered, are the indications to be fulfilled, and by these we may hope, with some degree of confidence, to tide our patient over this most terrible disease. Yet I am not forgetful that it has been said by good authorities, "if a patient suffering from idiopathic tetanus pass through a certain number of days of the disease he must recover, as in that time the abnormal irritability of the nervous system will have at length exhausted itself;" so that many of our reported cures may be illustrations of the motto, *post hoc non propter hoc.*

In one good case of neuromata attached to the superficial nerves of the thigh, I removed a large tumour from over the surface of the left popliteal space and another from the front of the left forearm in the same person. They had occasioned very distressing symptoms and the recovery was perfect; but the interesting points were that in the diagnosis of the tumours it was clear they were closely united to the nerves, for no pain was experienced when they were pressed from side to side transversely to the line of the nerve, and they seemed to be freely moveable in those directions, but as soon as the tumour was drawn, either upwards or downwards so as to stretch the nerve, the most exquisite pain was instantly produced. Where it is necessary to fix a precise diagnosis between the ordinary painful tumour of the skin and true neuroma, I think this diagnostic symptom will be found most valuable.

I now come to Class VII, A, diseases of the bladder, Table XXV. In this class those affections of the bladder necessitating the operation of lithotomy, or the removal of foreign bodies from the bladder, are the most interesting, and, perhaps, the most manageable; for, although they are very anxious cases for the surgeon, they are more amenable to treatment than many others with which he has to deal. There is, probably, no more troublesome case to have under management than a case of nervous irritability of the bladder. Of the latter, two cases in females are to be found in these reports, and in each of them, having thoroughly satisfied myself that the condition was purely nervous, the symptoms not having yielded to ordinary remedies and there being an absence of any signs of inflammatory cystitis, I adopted a line of treatment which, I think, from its result, might be occasionally repeated with great advantage: it is simply this, that the patient being under chloroform, the urethra is notched upon its pubic aspect by a sufficiently deep incision to permit the introduction of Weiss's urethra dilator, and the canal slowly expanded so as to allow the free introduction of the index finger; in this way the whole of the interior of the bladder can be carefully explored, and if no disease of the lining membrane be detected or the existence of any foreign body, the patient is placed in bed and the case managed like an operation for female lithotomy.

In these two cases which were so treated, the urine flowed away

TABLE XXV.

CLASS VII.—A. Bladder.

	Under 10 years.		Under 20 years.		Under 40 years.		Under 60 years.		Over 60 years.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
a. Irritable	...	...	...	...	...	1	...	1	...	...	...	2
b. Cystitis	1	...	3	...	1	1	4	1	1	...	10	2
c. Prostate	...	...	...	...	2	...	3	...	2	...	7	...
d. Lithotomy	2	...	2	1	2	...	1	...	1	...	8	1
e. Do. for foreign body	...	...	1	...	...	...	...	...	...	...	1	...
f. Hæmatura	...	...	1	...	2	...	...	...	...	...	3	...
g. Vesical fistulæ	...	...	...	...	...	1	...	...	...	...	...	1
	3	...	7	1	7	3	8	2	4	...	29	6
											35	

for several days, partly unconsciously, and then shortly with slight voluntary control, and, in each instance, there was a perfect cessation of the distressing symptoms, which had previously been complained of. This operation can only be regarded as a last resource in very intractable cases, but Mr. Bickersteth, of Liverpool,* has performed a similar operation in a case of malignant disease in the male subject, where an incision was made into the bladder through the perinæum to allow a continued drain of urine, and diminish the agony of the constant contraction of the bladder. As to the danger of permanent incontinence of urine, I can only say that in neither of these cases did that result follow, and I think this must be attributed to the method I adopted of first incising the sphincter of the bladder before dilating it, by which the circular fibres of that muscle are unfolded and not torn, and will, therefore, unite more completely afterwards.

I have nothing to remark upon the general treatment of prostatic disease beyond this, that in all cases where the urine was remarkably alkaline and at all fetid great benefit resulted from the administration of the hypo-sulphite of soda in scruple doses, about four times in the twenty-four hours. It seemed to preserve the acidity of the urine, or rather to correct its tendency to undergo putrefactive change, with the evolution of ammonia, and in this way much of the irritation on the mucous membrane of the bladder was prevented. The instance of foreign body in the bladder, which was removed by the operation of lithotomy, was one in which a boy had passed a piece of india-rubber tubing along the urethra and it had fallen into the bladder. There were great difficulties in diagnosing this case, because of the softness of the material and the way in which the tube had fallen into a large semi-circular curl in the bladder, too large to be easily touched by the point of the sound, as the beak of the instrument was rotated and too pliable to give any distinct impression when so touched; I was, therefore, compelled to use the endoscope to solve the difficulty. I saw the tubing and being convinced of its presence within the bladder, I did not hesitate to operate, and soon accomplished its successful removal. The whole of this case is minutely described in the volume of the 'British Medical Journal,' for 1869.

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* 'Liverpool Medical and Surgical Reports,' vol. i, p. 136.

The cases of lithotomy, nine in number, comprised eight males and one female; the latter, a girl, was admitted into the hospital on the 24th of June, 1867, with an abscess in the right *labium pudendi.* This had existed for more than three years, and was said to have grown spontaneously. A probe passed into the abscess struck a portion of dead bone, which was discovered to be on the right side of the pubic arch. Gouging was resorted to, and the sinus had nearly healed up when she left the hospital. She was again admitted on the 13th of March, 1868, the wound having never completely healed. Chloroform was administered, a deep incision was made parallel to the right labium and the right *ischio-pubic ramus,* so as to expose and allow the removal of a loose necrosed piece of bone which, from its position and shape seemed to have formed part of the upper and internal corner of the *obturator foramen.* All went on well, and the wound seemed to be healing kindly, when, eight days after the operation, the patient said the urine came occasionally in drops through the wound. It was a long time before I could satisfy myself as to this, but at last I was convinced that there was such an escape in very minute quantities, only a few drops at a time, and, therefore, some weeks afterwards, on the 15th of May, 1868, the bladder having become very irritable, she was placed under chloroform, and I passed a probe through the sinus, thinking it might possibly enter the bladder. I then introduced the sound into the bladder, and thought I was striking the end of the probe, when, to my surprise I discovered a calculus was present. I immediately proceeded to incise and dilate the urethra, so as to pass the finger into the bladder, and then with forceps, after some difficulty, I removed a small square-shaped calculus which seemed to be composed almost entirely of phosphate of lime, but in the interior of which, on section, a small piece of bone was found as a nucleus. She made a quick recovery, the sinus healed perfectly, and I heard no more of any escape of urine, the only thing to note being that from some fault of development in the bones of the pelvis, the *tubera ischii,* were unusually close together. I have it in my notes that the space between them was not much wider than the breadth of two fingers. This case is of interest because, I believe, it is rarely that a fragment of dead bone has been found to form the nucleus of a stone, yet Sir Henry Thomson has described in one of his lectures a very similar case (*vide* 'Brit. Med. Journal,' 5th January, 1867) in a man, where after disease of the pelvis a portion of dead bone was found as the nucleus of a vesical calculus. There is not much to be said about the eight cases of lithotomy in males, except that in one—J. H—, aged sixty-one—the patient had been lithotomised a very unusual number of times. In May, 1861, the first calculus had been removed by lateral lithotomy. Ten months later, sixteen calculi were extracted by the same operation, and in about the same period afterwards twenty more calculi were taken away. About one year previous to his coming under my observation he had been operated on in the same way by the late Mr. Jordan, who removed four calculi; he recovered from that operation, and then passed spontaneously ten more calculi, of average size, which were voided per urethram, so that in various ways, partly by art and partly by nature, before I saw this patient, he had formed and got rid of no fewer than 51 such concretions.

On March 8th, 1867, I performed upon him his fifth lithotomy and removed two calculi which weighed collectively 153 grains, they were composed almost entirely of triple phosphate, whilst the previous stones had been made up chiefly with large uric-acid centres. The man recovered and went back to the country, and I heard that he died in about 12 months from kidney disease, without experiencing any further symptoms indicative of the presence of stone in the bladder.

The next case in the descending order of age was S. C—, aged fifty-eight, upon whom I operated on the 8th of November, 1867, and removed a flat stone one inch and a quarter by one inch by five sixteenths of an inch in thickness. It was composed of uric acid; and weighed 99 grains, the man made a good recovery, leaving the hospital on the 17th of December in the same year. For three months before this operation the patient had complained of a severe fixed pain in the front half of the sole of the right foot which ceased completely after the calculus was removed. He said he believed that at the time the pain was so excessive, the stone had got bedded into the back part of the bladder; it is, I think, an interesting question to determine the cause of the pain in the soles of the feet in affections of the neck or neighbourhood of the neck of the bladder.

Professor Erichsen mentions that such pains in the feet are symptomatic of stone in the bladder, but the exact *rationale* of this symptom is not very clearly traceable, and, I think, is open to some further investigation.

The third case was that of J. K—, aged thirty-five, in whom symptoms of stone had existed for nearly six years. The urine and bladder were but very slightly affected, but he suffered so much from constitutional fever that, after sounding him, I was compelled to operate immediately, without waiting for it to subside, while the pulse was very rapid and the temperature high; this I did on the third day after the sounding, and removed a very large, heavy uric-acid calculus, which weighed 1590 grains.

He ultimately made an excellent recovery, and is now in good health, but for fifteen days after the operation he suffered excessively from hiccup, which at first seemed to defy all treatment, but was at last beneficially affected, and then subsided under the use of large doses of quinine and hypodermic injections of morphia regularly administered. This case was operated on on the 16th of December, 1870, and he left the hospital on 4th of March, 1871.

The fourth case, I. S—, aged twenty-two years, was operated on 5th of November, 1869, when a large oxalate of lime calculus, weighing 466 grains, was extracted. He recovered and left the hospital on the 13th of December following.

Case 5.—W. B—, aged thirteen years, was the subject of a calculus. Before the operation some slight amount of albumen could be detected in the water, with a few crystals of triple phosphate. He was operated on, 1st of July, 1870, and a rough spherical mulberry calculus removed weighing 135 grains. Recovered and left the hospital on the 29th of the same month.

Case 6.—J. H—, aged eleven years, was operated on on 5th of November, 1869, and a smooth globular uric-acid calculus removed, with a thin layer of phosphate, weighing 622 grains. Recovered and left the hospital, 9th December, 1869.

Case 7.—J. G—, aged seven years, was operated on, 13th October, 1871. Small uric-acid calculus removed, covered with phosphate and weighing thirty-two grains. Recovered and left the hospital, 11th of November, 1871.

Case 8.—G. W—, aged three years, operated on, 29th January, 1869. Removed two small phosphate calculi, weighing together eighty-three grains. Was made an out-patient on the 10th of March, 1869.

These are the only instances in which 1 have performed lateral lithotomy during the period covered by these reports, although other cases have been performed after these dates.

In the Sub-class B of this division of my subject, as shown in Table XXVI, stricture of the urethra forms the most conspicuous item. The cases I have had of this disease I have classified as traumatic and organic, two of the former and nine of the latter, of which one died. The operations I have practised for the relief of stricture cases, beyond simple progressive dilatation, have

TABLE XXVI.

CLASS VII.—B. Urethra.

	Under 10 years.		Under 20 years.		Under 40 years.		Under 60 years.		Over 60 years.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
a. Laceration of	......	......	2 ...	......	1...	......	... 1	......	......	......	3 1	......
b. Calculus in	1 ...	......	......	......	......	......	......	......	......	......	1...	......
c. Stricture, traumatic	......	......	......	......	2...	......	......	......	......	......	2...	......
d. Do., organic.........	......	......	......	......	3 1	......	3 ...	......	2 ...	......	8 1	......
e. Do., Holt's operat.	......	......	......	......	6...	......	1 ...	......	1 ...	......	8...	......
f. Do., Symes' section	......	......	......	......	2...	......	1 1	......	......	......	3 1	......
	1 ...	......	2 ...	......	14 1	......	5 2	......	3 ...	......	25 3	......
											28	
C. Penis and Scrotum.												
a. Phymosis operation	4	...	1	...	4	...	...	...	...	...	9	...
b. Paraphymosis	...	...	1	...	...	...	...	...	...	...	1	...
c. Syph. ulceration ...	...	...	...	...	...	...	...	...	1	...	1	...
	4	...	2	...	4	...	...	...	1	...	11	...
D. Testis.												
a. Orchitis	...	...	1	...	...	...	...	...	...	...	1	...
b. Epididymitis	...	...	...	...	2	...	...	...	...	...	2	...
c. Hydrocele	...	...	...	...	...	...	1	...	...	...	1	...
d. Do., radical cure...	...	...	...	...	1	...	3	...	...	...	4	...
e. Castration	1	...	...	...	1	...	...	...	...	...	2	...
	1	...	1	...	4	...	4	...	...	...	10	...

been Mr. Holt's operation and Mr. Syme's perineal section; of the former I have had eight cases, all of which proved successful. In some of them I observed that curious symptom urethral fever, the true nature of which is so difficult thoroughly to explain; for its treatment I have used quinine and opium, according to Mr. Holt's method, with great success. The form of stricture which is best suited, in my opinion, for this method of treatment is that which may be called the short and annular, as distinguished from the long and tunnel stricture of some writers. I have applied it to confirmed chronic cases of stricture, even where their origin has been traumatic, and with equal success; but inasmuch as the changes induced in this variety of stricture generally extend over a longer portion of the canal than would exist in the annular stricture, they are the cases, I think, which are the most suitable for Mr. Syme's section. In either of these two radical cures of stricture it is of the greatest importance to study beforehand the condition of the constitution, and specially in reference to the presence or otherwise of organic renal disease. If this be overlooked, or not attended to, it will be one great cause of fatal results. The one case of Mr. Syme's section which proved fatal, out of the four here reported, was in a man reduced to a very low state of health by the presence of numerous fistulæ, indicating that the urethra was extensively damaged. He had, in previous years, passed much of his life as a soldier in hot climates, where, I have reason to believe, he indulged largely in intemperate habits. All went on well for a few days after the operation, and then there was some difficulty, after removing the catheter, in re-introducing it, and it was soon after doing this that he had the first attack of rigors. These were repeated almost periodically, three and four times in the twenty-four hours, the man remarking that they resembled very closely the violent attacks of ague which he had experienced in some parts of India. Certainly, the phenomena were exactly similar to those I have observed in ague under ordinary circumstances, only immensely intensified; the cold stage, the stage of heat, the profuse perspiration, were all well marked and seemed to follow each attack in a very regular and definite course. Large quantities of quinine were administered, with moderate doses of opium, and they seemed to keep the rigors in check, so that for some time, I hoped, there might be some deeply seated abscess, or possibly some collection of matter in the neighbourhood of the neck of the bladder, which might, as is sometimes the case, lead to this form of irritative fever. Such, however, was not the case, and at last uræmic symptoms showed themselves, too clearly indicating, that either the urethral disease had extended to the kidneys, or that the latter organs had been themselves the subject of previous disease; the man died comatose on the sixtieth day after the operation.

In the next Sub-class (C) I have placed diseases of the penis and scrotum, as shown in the same table. I have only one case of syphilitic ulcer to refer to, because it is a rule of our hospital that such cases are not admitted under ordinary circumstances, they being regarded as proper subjects for our Lock Hospital. Hence it is that, except amongst the out-patients, our experience in the treatment of acute syphilitic diseases is very limited. This case, however, was a very peculiar one; it occurred in a married man, aged sixty-seven years, who resided at some distance, in the country, and when he presented himself in the reception room the appearance of the ulcer on the penis was, to a superficial observation, precisely that of epithelioma. On the left side of the penis, near the middle, there was an oval sore, quite superficial and very defined, with hard and jagged outline, with sharp, scarcely excavated edges, and lying upon it a scab of hardened secretions, from beneath which a serous discharge flowed, somewhat of the character we see in some forms of lupus. Soon after his admission, when the surface of the sore had been cleaned by emollient applications, the edges assumed a rather more defined outline, and, the fungous granulations being somewhat arrested, I charged the man with the possibility of his having been exposed to syphilitic inoculation. This, however, he indignantly denied, and he was so confident I was mistaken that I did not press the question, but represented the facts to our medical consultation, when the whole matter was well discussed, and it was agreed that the sore must be regarded either as an example of large, oval, soft chancre, or else some form of rodent ulceration of the part. On each side there were several small indolent inguinal glands, more numerous rather, on the same side as the ulcer. I therefore suggested, that the best way to solve the problem would be to submit the man to auto-inoculation. This being resolved upon, on the 17th of December, 1869, I inoculated him with a small quantity of the purulent serous discharge from the surface of the sore on the penis, by means of a lancet, as in the plan of ordinary vaccination, on the front and internal side of the right thigh, the side opposite to that on which the ulcer of the penis was situated. On the 18th it is reported—"Spot looks a little red, but almost as if from a scab of coagulum. 19th.—Can just detect a little sero-purulent vesicle with hemispherical projecting surface. 20th.—With lense, can now see the scab formed of dried secretion, which is separating at the edges, under which an excavating sore is in process of formation. 21st.—The spot is larger, the scab more adherent and more extensive, with red blush all round. He still adheres to his original story that he has not had any primary syphilitic inoculation, yet he says, '*If he has had it*, it must have been caught by contagion!' 22nd.—More distinct pustulation, but no separation and no further excavation." To-day it was decided to treat the case as one of syphilitic ulceration; black wash with opium was applied to the sore, and a quarter of a grain of iodide of mercury was given three times a day. On the 26th, when he had taken about nine of these pills, there was a slight improvement, both in the sore on the thigh and in that on the penis. On the 29th it was reported, both the sores are rapidly healing. On the 30th he was again shown to the consultation, and it was quite evident, the sores were specific, and that the treatment ought to be continued. On the 31st he was made an out-patient for a month, and told to continue the pills for a week, then, for a second week only twice a day, and for another week once a day, and to have internally a mixture of the citrate of iron and quinine. The ulcer on the thigh and the one on the penis were both healed in rather less than five weeks from the commencement of the mercurial treatment. This may be looked upon as an interesting case, on account of the inoculation being made so directly a means of diagnosis, the patient having so positively denied the possibility of any specific contagion.

In my cases of phymosis, of which I have to report nine, five in adults and four in children, I have varied the operations from the simple slitting up of the prepuce to complete circumcision; but after much consideration of the subject and trying various forms of incision I have come to the conclusion that, for adults, the best kind of operation is that which, I believe, is generally called Cloquet's method. It consists in a simple longitudinal division of the prepuce close to, but on one side of, the frænum, at the under part of the penis. This, provided the mucous membrane be sufficiently divided, and our opinion as to the advantages of this mode of operating, be delayed until all healing has been accomplished, and all œdema has subsided, will, I believe, be found to be in every respect a better kind of operation than the superior longitudinal cut. Still, I would not pledge myself to any one special form of incision, although, certainly, from the experience I have had, I give the preference to Cloquet's method.

In the Sub-class D are placed diseases of the testes and the operations required for their relief. I have only here to mention that in the radical cure of hydrocele I have generally employed iodine in some form, either as an undiluted tincture or mixed with water, and, this failing in one case, where the hydrocele sac had been very large, I repeated the operation, but varied it by using pure port wine in sufficient quantity to distend the sac and touch every part of its interior. The result was in every way satisfactory.

In private practice, where we are, perhaps, disposed to give preference to operations attended with a minimum amount of pain, even if not so certainly successful as the more severe ones, I have found the port wine treatment far superior to the iodine. In the latter, however carefully we may try to get the fluid to touch every part of the sac, on account of the pain produced to the patient, we are apt occasionally to fail in securing a perfectly successful result, and it is occasionally necessary to repeat the operation a second time. Now, with the port wine plan, old as it is, and much as it may be regarded as a vestige of antique surgery, I have found it invariably successful, and have used it, after iodine had failed, in more than one case, besides the one I have mentioned. The secret of success consists in thoroughly distending the sac of the hydrocele, by first noting the number of fluid ounces of serum which is drawn off, taking care, if possible, to inject in place of it at least one ounce more, of port wine, so as thoroughly to fill the sac; the fluid thus injected may be regarded as an alcoholic solution of astringent matter and should touch every part of the secreting surface. This can be done with very little pain, and yet subsequently cause a degree of inflammation sufficient to destroy the secreting power of the membrane, without the risk of sloughing or suppurative inflammation.

Among the operations for the removal of the testis, I have one case to remark upon, which I believe is not very common, in which the testicle was removed, not for strumous, but for syphilitic ulceration, with suppurating fungus. The history of the case showed clearly that the man had passed through all the stages of syphilis, and for some time the testis had presented the character of an ordinary syphilitic sarcocele. Then an abscess formed, and either burst or was opened by the surgeon in attendance, and a fungous growth protruded with a tightly bound band of tissue around its base. This had been treated for many months by local applications and anti-syphilitic remedies, but the patient himself was so anxious to get rid of the trouble and annoyance of the disease that he came into the hospital for the special purpose of having the testis removed. How far, being of specific origin, it might have been healed by longer perseverance in constitutional treatment alone, I am not in a position to state.

In Table XXVII, I have made three sub-classes :—E, diseases of the breast; F, ovarian diseases; G, diseases of the uterus, &c. Of the cases of malignant diseases of the breast, in the female, which I have had under treatment, two were so far advanced, and the surrounding tissue so infiltrated by the disease, that no operation was attempted. In ten cases, however, of scirrhus, and in five of carcinoma, the operation for the removal of the entire breast was performed, and all these fifteen cases so far recovered as to leave the hospital with the wounds very nearly, if not completely, cicatrized; their after-history, I regret to say, is not known to me with certainty except in one instance, the leading points of which were somewhat peculiar.

I may here remark that much is lost in the value of statistics of such operations as these, in hospital practice, by reason of the

TABLE XXVII.

CLASS VII.—E. Breast.

	Under 10 years.		Under 20 years.		Under 40 years.		Under 60 years.		Over 60 years.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
a. Abscess	...	...	...	...	...	4	...	...	...	...	...	4
b. Fibroid rec.	...	...	...	...	...	1	...	...	...	...	...	1
c. { Scirrhus	...	...	...	...	...	...	...	2	...	...	...	2
c. { Do., operation	...	...	...	...	...	1	...	8	...	1	...	10
d. Carcinoma, operation	...	...	...	...	...	...	...	5	...	...	...	5
	...	...	...	...	...	6	...	15	...	1	...	22
F. Ovary.												
Ovarian tumours	......	......	......	......	......	2 ...	......	......	......	... 1	.....	2 1
Ovariotomy	......	......	......	......	......	4 ...	......	... 1	......	......	......	4 1
	......	......	......	......	......	6 ...	......	... 1	......	... 1	......	6 2 8
G. Uterus, &c.												
a. Prolapsus, &c.	...	...	...	1	...	2	...	3	...	...	...	6
b. Tumours	...	...	...	...	...	2	...	2	...	...	...	4
c. Vaginal fistulæ	...	...	...	...	...	1	...	...	...	...	...	1
d. Cancer	...	...	...	...	...	...	..	2	...	1	...	3
e. Contusion of vulva	...	...	...	...	...	2	...	...	...	...	...	2
	...	...	...	1	...	7	...	7	...	1	...	16

extreme difficulty we have in following up the cases after they have once passed from under our care. In the practice of our hospital a great number of the patients come from long distances, and often leave behind them incorrect addresses; if written to about their cases they very rarely reply, or neglect to send, if so requested, periodical reports of their condition, so that for any attempt to determine how many of these cases have survived the operation, either for the average time, or for a longer period, my information is very imperfect. In private practice it is otherwise, and it is from following out those cases that we are better able to judge of the real prospective advantages of operations in malignant disease. The interesting case referred to above, and of which I have now to speak, was that of a woman, A. G—, aged sixty-six, a nurse by employment, and for one year previously a widow, having had eight children, the youngest twenty-two years of age. She applied for admission on account of pain and enlargement in the glands of the axilla on the right side, and said that in her last confinement she had an abscess in each breast, and was obliged to desist from suckling her child. On examining the breasts I found both nipples pretty equally retracted. In the right breast, which was examined most carefully, no hardened mass or new growth could be in any way detected, although, the patient being very stout, it may have been overlooked. At any rate it seemed almost as if the disease was at that time confined entirely to the axillary glands; the pain was excessive, and the woman very willing to submit to any operation. When placed under chloroform I proceeded deliberately to dissect out by a not very deep but long incision the whole mass of enlarged glands from the axilla. In this operation I had the good fortune to have the able assistance of the late Mr. Beever, whose skill and coolness in severe operations are known to all who have witnessed the practice of our infirmary. He helped me greatly in what was a very tedious operation, the axillary vein being laid bare for fully an inch and a half of its length, and we had good reason to believe that the whole of the disease had been taken away. The operation was conducted as nearly on antiseptic principles as was possible in those early days of practice; antiseptic ligatures were used, the wound healed very satisfactory, and in one month and two days, after the operation, she left the hospital, with the wound well cicatrized except in one small place. One symptom remained; she had a curious numbed sensation along the palmar branch of the right ulnar nerve, which extended to the dorsal aspect of the hand along the same track of nerve. She went to Southport, and remained there for some time apparently in every way quite well, but at the end of eight weeks from the closure of the wound again presented herself at the hospital, and complained bitterly of a severe pain in the right breast, where I could feel distinctly by deep pressure a nodule of hard tissue, deeply situated in the sternal half of the breast. The line of the cicatrix was quite soft except just in front, and here there was a tubercle which had a somewhat black, almost melanotic, appearance. From the patient's testimony as well as from my own observation I was inclined to think that, all that was now to be felt in the breast had grown rapidly since the closing of the axillary wound. I therefore proceeded to remove the whole of this breast, which I did in the usual way by a very free elliptical incision; the wound healed equally well with the former one, and in about five weeks it was completely cured. When the axillary glands and the hard tumour removed by the second operation were examined under the microscope, there was distinctly visible in them an abundance of double nucleated cells closely packed together in a hardened stroma. Now, this patient has been under my frequent observation from the end of July, 1868, when the first operation was performed, until the present date, more than five years, she is in excellent health, both cicatrices are quite soft, there are no longer any pains as the result of nerve pressure, and if the tumour in the breast or the glands in the axilla were malignant the disease must have been in a dormant, not really active, stage, and the early removal of the local disease has checked the general contamination of the system.

In ovarian tumours I have to report three cases in which it was not thought proper to attempt any operation, and five cases in which ovariotomy was performed. Of the latter four recovered, and one died three days after the operation, from peritonitis. In one out of the four cases a large cyst in the tumour was the subject of extensive suppuration, and at the time of the operation I found it impossible to remove it. I followed, therefore, the plan advocated by Mr. Bryant for such cases. I did not disturb the adhesions which surrounded the tumour on its anterior aspect more than I could avoid, but making a free incision into the cyst, I let out about five and a half pints of purulent fluid, then enlarged the incision to fully three inches, fixing the edges by sutures to the sides of the wound in the abdominal wall, and stuffed the interior with strips of lint. The lint was removed the next day, the cyst was washed out with a weak carbolic-acid lotion, and from day to day it slowly but surely contracted, and the whole of the tumour gradually collapsed. Although the patient suffered from a fistulous opening for many months, in which it was necessary to use a wire-drain tube, at last this closed up, and she made an excellent recovery, with nothing to be detected through the abdominal wall but a general thickening of tissue about the breadth of the two recti and half their length. In each of the other cases where the tumour was removed Mr. Spencer Wells' semi-circular clamp was used, and every precaution taken to avoid, both at the time of the operation and subsequently, putrescence in the dressings, and pyæmic inoculation. The patients in these four cases of recovery are now living, or were so within a few months of the date of this report.

Among the diseases of the uterus I have only to mention one case of polypus removed without difficulty by Dr. Aveling's uterine *polyptrite*, from the right side of the cervix; the stalk of the polypus was very firm and nearly an inch and a half in diameter, yet it was cut through without difficulty. The case seemed to go on satisfactorily, and she was allowed to leave the hospital about fourteen days after the operation, all discharge having ceased, and, as far as could be determined by tactile examination, the stump of the polypus had entirely healed. Whether she got some chill or cold on her journey home or not I cannot tell, but I afterwards heard that she suffered for many weeks from inflammation of the lymphatics on that side, with all the phenomena of the white leg of lying-in women of the older authors, from which, however, she ultimately recovered.

In two cases of prolapsus, or rather *procidentia uteri*, I operated for the relief of the deformity with good success. One has proved to be a very interesting case, as I have been able to follow its after-history for a longer period than usual. E. W—, aged eighteen, unmarried, had suffered from entire procidentia uteri for about two years, and she had previous to that period been subject to epileptic fits. It is supposed that from the convulsive efforts she made in one of these attacks, the uterus became prolapsed, and the displacement was increased by her occupation as a weaver in a factory, where she had to stand many hours each day. The uterus was entirely procident, and could not be kept within the pelvis by any of the mechanical appliances which had been used; therefore, on the 21st of April, 1871, the patient being under chloroform, I passed two fingers into the rectum, and forced down the tumour as far as possible, so as thoroughly to distend and unfold the everted vagina. The fingers of an assistant were then substituted for my own, and in this way the uterus was kept firmly fixed and thoroughly prolapsed during the operation. I then dissected off a very large piece of mucous membrane and some of the submucous tissue of a triangular form, its apex being nearest to the orifice of the vagina, each of its three nearly equal sides measuring fully two and a half inches, and the front angle being somewhat rounded. This being done, thirteen catgut sutures were made to traverse from the edges of the wound entirely across the exposed surface in parallel rows. Then, after all bleeding and oozing of fluid had ceased, which was expedited by touching the surface freely with spirits of wine, I proceeded to tighten up the ligatures one after the other as the tumour was slowly returned into the vagina, the suture nearest to the orifice being the last to be tied. The after-treatment consisted in gently syringing the passage with a weak solution of Condy's fluid twice or thrice daily. I had no further trouble with the case, and saw no more of the sutures, which most likely dissolved away after having served their purpose. At the end of a month I made a digital examination, and found the uterus in a good position, and the vagina so far contracted as almost to be in the normal virgin state. The patient was directed to use a weak astringent lotion of zinc and alum from time to time, and to report progress. I saw her once or twice after this during the succeeding six months, and there was not the slightest return of the prolapsus. I have heard recently that, rather more than a year since, she was married, and within the last few weeks she has given birth to a living child and done well, without any displacement of the uterus or other disturbance.

Class VIII, Sub-class A, is devoted to such cases of injuries and diseases of the eye as have been under my treatment in the hospital during the period over which these reports extend. As will be seen by Table XXVIII, they are not very numerous, and in no case have I to mention any special points of interest. With regard to diseases of the eye generally, I may quote the words of a writer on operative surgery well known to the profession, who says—"This subject has now become so special, and so much has lately been done in it, that, in the absence of any great personal experience, I gladly refer the reader to the admirable works we possess." So I may say with reference to diseases of this organ, that the cases here noted down have been forced upon my attention more by circumstances over which I had no control than by any special selection, and they are cases which, under the regulations now in force at our hospital, would be handed over to our recognised oculist.

In Sub-class B, in which I have placed affections of the ear, I have only to mention two cases—one of congenital deformity, and one of carcinoma. The congenital deformity was of special rarity, and I related the particulars of it minutely in the Physiological Section of the British Medical Association, at Oxford in the year 1868. It consisted essentially in a displacement of the external ear and those parts which seem to grow in harmony with it; for, situated on the left side of the face, near to the middle of the cheek, was a well-formed auricle, and at the spot where the external meatus ought to be placed was a slight depression in the surface of the skin, beneath which could be felt a hollow in the position of the absent zygomatic process, and the imperfectly formed articulation of the temporo-maxillary joint. The vertical, and part of the horizontal, ramus of the lower jaw of the same side were but slightly developed. Of course, there was no power of audition on that side. The opposite side of the cranium and face were quite natural, but the left commissure of the lips at the angle of the mouth was extended backwards for about half an inch, forming, in fact, a sort of harelip fissure at this particular part of the oral aperture. The

TABLE XXVIII.

CLASS VIII.—A. Eye.

	Under 10 years.		Under 20 years.		Under 40 years.		Under 60 years.		Over 60 years.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
a. Injury to orbit ...	...	...	...	...	1	...	...	...	...	...	1	...
b. Tumour on eyelid	...	...	...	...	...	...	1	...	...	...	1	...
c. Pannus corneæ ...	...	...	...	...	...	...	1	...	...	...	1	...
d. Iritis, specific	...	...	...	...	...	...	1	...	...	...	1	...
e. Iridectomy for glaucoma	...	...	...	...	1	...	...	...	...	...	1	...
	...	...	...	...	2	...	3	...	...	...	5	...
B. Ear.												
a. Congenital displacement..............	...	1	...	...	...	...	...	...	...	...	...	1
b. Carcinoma auriculæ	...	...	...	...	...	...	...	...	1	...	1	...
	...	1	...	...	...	...	...	...	1	...	1	1
											2	
C. Nose.												
a. Lupus	...	...	...	...	...	1	...	...	...	...	...	1
b. Ozæna...............	...	...	...	...	1	...	...	...	...	...	1	...
c. Polypus	...	...	...	...	...	2	...	...	...	...	...	2
	...	...	...	...	1	3	...	...	...	...	1	3
											4	

friends of the patient—a little girl, aged two and a half years—were very anxious that something should be done to remove this conspicuous deformity. The child was therefore put under chloroform, and I proceeded carefully to dissect off this misplaced external ear; in so doing, I was surprised to find that while the cartilage itself was well formed and very nearly as large as the external ear of the other side, there was attached to it a ring of bone, the tympanic bone of the ear. When these two structures had been removed and carefully examined I found in them a *membrana tympani* and the process of the *malleus;* showing that there had been at some particular period of early intra-uterine growth a misplacement of the primordial cell from which these parts ought to be evolved, and suggesting the idea that, under ordinary circumstances, the external ear, the tympanum, and some of, if not all, the ossicles, are developed from the same centre, which, in this particular deformity, had wandered from its normal position. These facts must be regarded as possessing great physiological interest in relation to embryology. The wound thus formed on the cheek was well supplied with blood, and two very small arteries deeply buried in the cartilage gave some trouble, yet it healed very well and left but a slight scar. I have repeatedly seen this child up to within a few weeks past, and it seems that now, after just five years (the operation was performed on the 9th of December, 1867) the developmental force has so far exerted itself upon the left half of the face and cranium as to remedy very considerably the disproportion of these parts. Yet there was one difficulty which had to be overcome, viz. a tendency for the left cheek to become adherent to the gums of the upper and lower jaw. These I have on three occasions divided, placing between them a silver plate, and more recently a flattened oval ivory plug, which latter instrument has answered the purpose excellently, and the child has now a very good, useful supplementary cavity on this side of the mouth.

The case of carcinoma of the external ear (which is not a very frequent seat of cancer) is one of the only two cases I have seen, and the chief peculiarity to mention in it is that the carcinomatous or, perhaps I might say, the epitheliomatous ulceration, although commencing in the free portion of the auricle itself, had, when I saw the case, extended to the temple and the skin over the mastoid process, so that to attempt to remove the whole of the diseased structures was impossible; and as a great portion of the auricle had been destroyed by the ulcerative process I was content to apply strong nitric acid to the whole surface, with the hope of destroying it and checking the progress of the disease. I employed this caustic because it was said that from the first the ulceration had been attended with frequent arterial hæmorrhages. It did very well, but the man would not remain in the hospital and only came from time to time to show himself. He was under observation for nearly three months, after which he ceased to attend as he lived a long way in the country, and I heard from his friends that constitutional cachexia suddenly set in, from which he died in a few months. He was sixty-three years of age, and up to the very last frequent and very excessive arterial bleeding recurred, the blood, on many occasions, spurting out suddenly, to the distance of several inches from the surface, in a continued stream.

In Sub-class C, *a*, lupus, I had one case upon which I have simply to remark that, as far as the temporary arrest of the progress of the disease was concerned, considerable benefit seemed to be derived from the application of the undiluted *Liquor Fowleri* to the ulcerating surfaces. The same preparation was also administered internally in three minim doses, with drachm doses of the syrup of the iodide of iron, but as the case passed from under my observation, I can only speak of what appeared to be of temporary service.

In the cases of ozæna (*b*) from diseases of the bones of the nose, most likely of a specific nature, the patients gained much relief by using a modification of Dr. Thudichum's nostril douche, which I contrived by simply having a small tin vessel, which would hold about a pint, so fashioned as to hang steadily against the wall on a nail, and connected to the lower part of this reservoir a piece of elastic tubing with a tap, and beyond this a tube of wood suited to fit the nasal aperture. All things being arranged, and the patient holding his face well over a basin, the mouth being kept widely open, the tap is gently turned and the fluid in the douche, which is generally water slightly medicated by some saline matter, as Condy's fluid, or some weak solution of nitrate of lead or carbolic acid, is allowed to well up the nostril very slowly until at last it fills the cavity, and passing across the septum of the nostrils comes down the other side. In this way the current of fluid can be directed up or down either nostril with ease, and there can be no better method designed for cleansing the diseased surfaces. It was not until I had read Dr. Thudichum's paper on the treatment of these affections of the nose, that I knew that so valuable a practical application could be made of the physiological fact discovered by E. H. Weber, of Leipzig, before 1842, and referred to by Dr. Thudichum, that it is possible, under certain conditions, to send a stream of water up one nostril and down the other, without any portion of it passing either into the pharynx or the mouth.

In polypus of the nose (*c*) I have had two cases in hospital, one a very large polypus in the right nostril, in a woman, aged thirty years, who had suffered from the disease for more than two years, and on whom several attempts had been made to remove the mass, which was of fleshy hardness, by the forceps and by a partial division of the ala of the nostril. When she came to the hospital I placed her under chloroform, and made such an incision through the upper lip into the floor of the nostril as would be required for the removal of the upper jaw, according to Sir W. Fergusson's method, and by this means, having got a good view of the position of the polypus, I had much difficulty in exposing its attachments, which I found sprang from the anterior edge of the opening of the antrum; for, at first the hæmorrhage was very considerable, almost irrepressible, and each time the surface of the polypus was touched the part was deluged with blood. Having made one or two attempts in this way to get hold of the base of the polypus, so as to pass round it a ligature or wire écraseur, it occurred to me, whilst operating, that Dr. Oldham, many years ago, had made the important statement that in uterine polypi the most frequent source of hæmorrhage is from enlarged veins just beneath the mucous covering which contains them, and not from the centre of the mass. Acting upon this idea, I immediately proceeded to slice off a large portion of the polypus, under the conviction that when I came to the centre I should not have more, but, perhaps less hæmorrhage than when I dealt only with the surface. This proved to be correct, for after taking away two or three large pieces, I saw exactly the base of the mass (which before had been hidden from view, being closely jammed in between the expanded bones), I then cut it through with the scalpel, and, contrary to what might have been expected, the hæmorrhage immediately ceased, the only bleeding that really occurred being from the walls of the great cavity which was thus exposed. The whole of the polypus so removed was fully equal to the size of a large goose-egg, being three and a half inches long and two inches wide transversely; the attached portion was the narrowest part. The interior of the nostril was then dressed with a solution of the perchloride of iron on strips of lint, which were so arranged that they could be pulled out through the nose. The divided edges of the lip were restored to position by hare-lip pins. The woman rapidly recovered, except that for some time after she suffered from obstruction in the left nostril from the septum having been pushed over completely to that side, but this was corrected by the use of an ivory plug. I saw her about six months afterwards, and she was then perfectly well, having had no return of the disease.

In the other case, in which there was also a polypus in the left nostril, but not nearly of the same extent, when the patient applied to me at the infirmary it was for obstruction of the left lachrymal duct, with much epiphora, which I soon discovered was due to the polypus distending the nostril and closing the duct. There were several polypi, a few of which were of large size. Some I removed with the torsion forceps, and others I cut through with Marshall's scissors. In this way, after three operations, I completely emptied the nostril, and then a new feature showed itself, for about this time the woman directed my attention to a small abscess at the nasal extremity of the left eyebrow. When this was opened and a probe introduced it was found that a portion of the frontal bone was necrosed, and it was a long time before by one or two operations of gouging it out that the sinus could be closed. I think in this case some portion of the polypus must have been pressed into the frontal sinus, and, by interfering with the nutrition of the wall of that cavity, led to the death of the bone, and although she could at no time force air through the sinus beneath the eyebrow, yet a probe could be passed nearly an inch and a half horizontally across the middle line quite in the direction of the sinus itself. She, also, at the end of nearly eighteen months, had a good recovery.

In Sub-class D is recorded, as shown in Table XXIX, a case (*b*) of abscess of the tongue, which occurred in a man, by occupation a coachman, aged twenty-seven, who had suffered from swelling of the tongue on the left side for nearly a week previous to his admission into the hospital, when the tongue was of immense size; he could, however, swallow fluids. The swelling was chiefly situated on the left side, and when I saw it there was an obscure feeling of fluctuation. After a few hours this increased, and in the middle of the night the abscess fortunately burst about the centre of that side of the tongue. More than a fluid ounce of matter was expelled, and when I looked at it next day the tongue was nearly reduced to its natural size. It was very curious to observe how completely the abscess was confined to one side of the tongue only. This is the only case of the kind that I have seen; it healed quickly, and the man went out well. He could not give any account at all as to the possible cause, and there was nothing in the condition of the teeth or gums to explain it.

In division *c* I had an interesting case of a very large ranula, in a boy, aged fourteen years, which had been tapped through the mouth on several occasions before he came under my notice. This I treated with four silk setons passed through its wall beneath the tongue, and thus set up suppurative inflammation. Although as soon as the inflammation increased I removed one seton day by day until only one was left, yet the irritation ran on to so high a degree that an abscess formed beneath the jaw, which I was compelled to open, and in this

TABLE XXIX.

CLASS VIII.—D. Mouth, Palate, &c.

	Under 10 years.		Under 20 years.		Under 40 years.		Under 60 years.		Over 60 years.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
a. Hare-lip	1	3	1	...	...	...	...	...	...	...	2	3
b. Abscess of tongue	...	...	...	...	1	...	...	...	...	...	1	...
c. Ranula...............	...	...	1	...	...	...	...	...	...	...	1	...
d. Epithelioma of lip	...	...	...	...	...	...	...	...	2	...	2	...
e. Do. of tongue......	...	...	...	...	...	...	1	...	...	...	1	...
f. Epulis	...	...	...	...	...	1	...	...	...	...	...	1
g. Cleft palate.........	...	1	...	...	...	...	...	...	...	...	...	1
h. Tumour of palate	...	...	...	...	...	1	...	...	...	...	...	1
i. Ulceration of fauces	...	...	...	...	1	...	...	...	...	...	1	...
k. Strict. œsophagus	...	...	...	...	...	...	...	...	1	...	1	...
	1	4	2	...	2	2	1	...	3	...	9	6
											15	

E. Larynx and Trachea.

	Under 10 years.		Under 20 years.		Under 40 years.		Under 60 years.		Over 60 years.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
a. Specific ulceration	......	......	......	......	......	2 ...	......	......	......	......	......	2 ...
	......	......	......	......	......	......	......	......	......	......	......	......
b. Tumour	......	......	......	......	......	......	1 ...	1 ...	......	......	1 ...	1 ...
	......	......	......	......	......	......	......	......	......	......	......	......
c. Tracheotomy......	1 ...	......	......	......	......	......	1 ...	......	......	......	2 ...	......
	......	......	......	......	......	......	......	......	......	......	......	......
d. Cut throat, suicid.	......	......	......	......	... 1	......	1 ...	......	1 1	......	2 2	......
	......	......	......	......	4 1	......	......	......	......	......	4 1	......
	1 ...	......	......	......	... 1	2 ...	3 ...	1 ...	1 1	......	5 2	3 ...
	......	......	......	......	4 1	......	......	......	......	......	4 1	......
											9 3	3 ...
											15	

way, although not wishing to do so, formed a second opening, which I feared might lead ultimately to a salivary fistula. This, however, I am able to report was not the case, for rather more than a month afterwards the whole of the cavity of the ranula, which at one time would have held nearly two ounces of fluid, closed up, and the boy was discharged cured. I mention this because I have recently had a very similar case in which the same fear was entertained that the external opening might become fistulous, but fortunately it did not.

In division *d* (epithelioma of lip) I have had two operations in hospital, both on the lower lip, and the only peculiarity to note is that I adopted the plan of dressing which I first saw employed by Dr. Joseph Bell, of Edinburgh; this is to use the uninterrupted suture for bringing the edges of the wound together, instead of hare-lip pins, and to apply nothing whatever to the surface afterwards—neither collodion, dry lint, plaster, nor any other protection—but, to depend entirely upon the hardened crust of coagulated blood which may form just over the line of union of the wound. This method is much superior, as far as comfort to the patient is concerned, to the plan of using pins, and, as far as I have yet seen, is in every way an improvement.

In Sub-class E, *c*, are the cases in which tracheotomy was performed. They are two, one of which was in an adult, aged forty-nine, for tumour on the side of larynx, displacing it, and producing excessive dyspnœa. He was greatly relieved by the operation, and left the hospital in about three weeks to go into the country, but I subsequently heard that, although he wore the tube to the end of life, he sank six months after leaving the hospital from the increase of the tumour, which was unmistakeably of a malignant character. The other case was in a little boy, aged six years, brought into the hospital for attacks of dyspnœa, caused by a small piece of the shell of a periwinkle having been drawn into the trachea, and down into the branch of the left bronchus, from which I presumed it was occasionally displaced and in some way led to spasmodic closure of the rima, for it was found on auscultation that in the upper one third of the left lung all respiratory murmur was absent. Tracheotomy was performed; he went on favorably for eight days, when suddenly, in a spasmodic attack of coughing, the foreign body was dislodged, and respiration was again heard equally in every part of the chest, and the little patient recovered.

In Sub-class E, *d*, I have placed those cases of cut-throat and injury to the larynx which were suicidal in their nature. They are nine in number, and all in the male sex. In five of these the immediate cause was clearly traceable to drink, or the depression which followed in its train, and one of them was fatal. The other four were in persons who in some way, previous to the act, had shown indications of insuperable mental depression due to disease, and two of these died. Thus, out of the nine cases there were six recoveries and three deaths. One case is especially deserving of note, as the incision made by the unfortunate subject was of such a nature as to expose completely, by a transverse cut across the thyroid cartilage, just above its lower edge and in a direction upwards and backwards, a view of the arytænoid cartilages and the true vocal cords. I saw the patient shortly after his admission into the ward, and, his head being thrown backwards, the whole mechanism of the vocal apparatus was brought into view, presenting such a perfect picture as no laryngoscopic mirror ever reflected. It was deeply interesting, although sad, to watch how, in his attempts to speak, and in the production of such words and sounds as could be articulated without the help of the tongue and lips, the vocal cords were played upon with marvellous rapidity by the muscular apparatus of which they are the servants. This continued only for about four hours, when the man, in spite of all efforts to support him against the shock his nervous system had received, sank from sheer exhaustion.

In Sub-class F, Table XXX, are placed diseases of the rectum. Here there were three cases of hæmorrhoidal tumours in which ligatures were applied with perfect success, but in another case, where the man was of very intemperate habits and there were symptoms of early phthisis, I did not venture upon any operative interference.

TABLE XXX.

CLASS VIII.—F. Rectum.

	Under 10 years.		Under 20 years.		Under 40 years.		Under 60 years.		Over 60 years.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
a. Condylomata			1								1	
b. Hæmorrhoids					1						1	
b. Do. ligatured					1		2				3	
c. Abscess near			1		1						2	
d. Fistulæ					1		1				1 1	
d. Do., operation			1		3	2	2				6	2
e. Malignant disease						2	1				1	2
			3		6 1	4	6				15 1	4
											20	

In division *d, fistula in ano,* or rather *fistula recti,* I have had eight cases of operation, which have all done well; and two in which I did not operate, one of them being a case of active phthisis and the other in a gentleman in broken-down circumstances, who came into the hospital with many sinuses left near the anus from previous operations for fistulæ. In this case the disease seems to have been brought on by injury to the soft parts, or possibly the bones of the pelvis, caused by riding on horseback without saddle, exposure to the weather, bad food, &c., and after being in the hospital for some weeks, and only partially relieved by the use of injections, enemata, good food, and tonics, he sank from coma, the result of disease in the kidneys. In this case I was deterred from making an attempt to divide any of the fistulæ, by special information I received, that on previous occasions he had shown such a great tendency to the hæmorrhagic diathesis. I consequently thought the operation would be attended with unjustifiable risk, the ultimate benefit being so very uncertain.

With regard to the operation, or rather the after-treatment, in cases of *fistula in ano,* I have only one practical remark to make and that is, that I have found it a very useful plan, as a rule of practice in all cases (if possible), when the patient is pronounced cured or nearly so, to pass the rectum speculum into the bowel with the fenestra towards the line of the incision of the fistula, examining carefully the whole length of the wound by using a probe curved into a hook, which, being passed up the bowel within the speculum, can be drawn down to ascertain positively that no pouch of unhealed tissue remains, opening upwards into the bowel, and closed towards its cutaneous extremity. This, I believe, when neglected, often leads to difficulties in these cases, for there is such a great tendency for the track of the fistula to heal where it joins the skin rather than the mucous membrane, and such pouches frequently remain for a long time and form the cases in which it is said the patient has been operated on for fistula without success. Sometimes, the blunt-curved probe will break down the newly formed tissue and fully open the pouch, and in this way a more perfect cicatrix will be formed, or it may be needful to use the guarded, cutting, hooked knife which I have described as specially suited for cases of internal blind fistula.

In division *e*, I had one very distressing case of malignant disease of the rectum in a young woman, aged twenty-six, in whom it advanced very quickly, and I had the opportunity of noting how the stricture of the bowel which accompanied it was caused by the constant disposition malignant deposits have to contract in some of their forms, as, for example, in the retracted nipple of the cancerous breast, for in the case to which I refer, within five weeks of my first examination, the malignant mass around the bowel had diminished the calibre of the canal from that which would permit the free passage of the finger to a circle little less than a quarter of an inch in diameter. It was a case in which, had the patient been willing, I should gladly have performed colotomy, but she preferred to go home rather than submit to any such treatment, and in a very few weeks she died. It was the most rapid case of this fearful disease that I have ever witnessed.

Here I must bring to a conclusion this superficial account of "Five Years' Surgical Work in the Manchester Royal Infirmary."

It would have been possible, if time and space had permitted, to have expanded the subject much more completely, and to have related in detail many other cases of considerable interest. But, I trust, what I have now written will induce other workers in the field of practical, and scientific surgery, to undertake a similar task, that we may be able to compare the work done here with that in other hospitals over an equal period, and thus illustrate the utility of following out some "ready method of recording surgical cases in hospital practice."

ON SOME CASES OF CONTRACTED BURN CICATRIX TREATED BY THE TAGLIACOTIAN OPERATION.

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THE following cases are published as a contribution to the art of remedying the deformities of contracted cicatrices, and more particularly as showing the perfect practicability of a well-known procedure, which, it appears to me, is not sufficiently appreciated by modern surgeons. I have no wish, however, to claim for this procedure as applied to such cases any superiority over other methods of treatment, because, in the first place, I can scarcely say that I have had experience of these methods; and, in the second place, because numerous cases are on record in which, though treated in various ways, equally good results are said to have been obtained. Earle,* for example, revived the method of complete removal of all cicatricial tissue, allowing the resulting wound to granulate. Dupuytren† had recourse to transverse division of the cicatrix at different points, with subsequent application of an extension apparatus. Skey‡ has recommended a somewhat similar procedure. James§ made an incision on three sides of the cicatrix, and dissected it upwards as a flap, allowing it to adhere to the deeper tissue at a higher level, an extension apparatus being also employed. Butcher|| and Buck¶ have also recorded cases in which this plan was adopted. Mütter, of Philadelphia,* Carden,† Teale,‡ and Holmes,§ have published cases in which, with more or less success, the cicatrix was divided, and the gap filled up with skin from the adjacent parts. Others, again, have been successful with simple extension of the contracted parts without application of the knife. Of treatment by means of transplantation of skin from a distance, in the true Tagliacotian fashion, I have succeeded in finding one case only—that of Mr. John Wood.||

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* Earle, 'Med.-Chir. Trans.,' vols. v and vii.
† Dupuytren, 'Leçons Orales,' tome ii.
‡ Skey, 'Lancet,' 1870.
§ James, 'Med.-Chir. Trans.,' vol. xiii.
|| Butcher, 'Operative and Conservative Surgery.'
¶ Buck, 'American Journ. of the Med. Sciences,' 1872.

No doubt any or all of these modes may be successfully employed in suitable cases, and in their selection much will depend on the turn of mind of the surgeon. The question, as it presented itself to me in the cases I am about to narrate, was as follows:—It is impossible, without more or less extensive division of the cicatricial tissue, to restore the parts to anything approaching their normal condition; this having been done, and the limb extended, what will be the best mode of proceeding with the resulting gap? I judged that the sooner it was closed the better, the extensibility of the limb being at the same time secured, and that to attain both of these ends it would certainly be better to restore the loss of tissue with sound skin than to trust to the slow process of granulation. The next question was, whence should this piece of skin be procured? Bearing in mind that there had already been considerable destruction of tissue in the affected parts, it was reasonable to suppose that, if it were possible to do so, a more satisfactory result would be obtained by transplanting from a distance than from the immediate neighbourhood. In the case of the arm there appeared to be no great difficulty in carrying this out, since the limb, when in repose, is in juxtaposition to the trunk, and it would, therefore, only be necessary to bandage it carefully in a convenient position after the application of the flap. In the case of the neck being the part affected, however, there appeared to be greater difficulty, as the long-continued restraint

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* Mütter, 'American Journ. of the Med. Sciences,' 1842.

† Carden, 'Prov. Trans.,' vol. xii.

‡ Teale, 'Med. Times and Gaz.,' 1857.

§ Holmes, 'Lancet,' 1863.

|| Wood, 'Med.-Chir. Trans.,' vol. xlvi.

of the arm, in an unnatural position, would be extremely irksome, although, at the same time, as rhinoplastic operations show, the difficulty is not insuperable. I determined, therefore, in Case I, which was the first of the series which came under my care, to transplant from the trunk in operating on the arm, and afterwards, when I came to treat the neck, to be influenced by the appearance of the wound and adjacent tissues after division of the contraction, in my selection of a place, distant or remote, from which to take the necessary flap of skin. As will be seen, I selected the latter method on each of the four occasions on which I operated on the neck. In all of the four subsequent cases, the arm being the part principally involved, I was able to take the flaps from the trunk.

I shall relate the first case somewhat in detail, as in it the deformity was greatest, and it will also serve to show, without tedious repetition, the plan of treatment pursued in each of the others. The appended autotypes of two of the cases illustrate pretty well the amount of success obtained by the operation.

Case I.—Ann C—, æt. 7 years, admitted to the Clinical Hospital, July 7th, 1870. Two years previously her clothes took fire, and she was extensively burnt about the neck and right arm. The burnt surface took four months to heal. A broad cicatrix, divided into numerous bands, extending from the shoulder to the sternum, binds the head down to the right side, and makes considerable traction on the same side of the face. Another band extends from the arm to the forearm, so that the elbow cannot be extended beyond an acute angle.

July 7th.—I transfixed the cicatrix in the arm and cut out the knife. The arm was then extended as much as possible, and the tissues touched with the knife as they were put on the stretch. Before the arm could be fairly extended it was necessary to divide the tendon of the biceps. Four minor vessels were also divided. They were ligatured with carbolated silk, the ends of which were cut short. A diamond-shaped flap was then marked out on the sides of the chest at a proper level and dissected off, except at the anterior angle, where a pedicle was left about an inch in width. The flap contained the whole thickness of skin and subcutaneous fat down to the cellular tissue. As marked out originally, it was a little less in extent than the wound to which it was to be fitted, and it contracted considerably on separation from the chest wall. The flap and wound were then dried, and the former carefully stitched with numerous points of silver suture to the edges of the latter, the inner angle of the wound, which corresponded to the pedicle, being necessarily left uncovered. A pad of lint was then placed over the flap, and the arm bandaged in a flexed position to the chest.

23rd.—Up to this time the parts were dressed as often as needful for cleanliness, and to-day the stitches were removed; flap firmly united.

30th.—Part of pedicle divided.

August 3rd.—Arm entirely detached from side, the flap being at the same time enlarged by dissecting a little more from the chest wall, to cover a considerable extent of raw surface which remains on the inner side of the arm. The elbow is stiff and is extended with pain and difficulty.

10th.—The greater part of the addition to the flap has sloughed, the portion remaining being only a rounded nodule. Pressure applied to it by strapping.

22nd.—Splint applied posteriorly for extension.

September 21st.—Neither the sore on the chest nor that on the inner side of the arm have yet quite healed. To-day part of the cicatrix in the neck was divided, leaving a raw surface about two inches by one and a half inch. A flap was dissected up from over the deltoid and turned round to fill up this gap, the surface from which the former was taken being drawn together by sutures.

28th.—Several stitches removed from flap, which is looking well. From this date to October 20th the child passed through a smart attack of erysipelas, affecting principally the parts involved in the operation. This, it would appear, was communicated by her mother, who paid her a visit when recovering from erysipelas of the face.

October 27th.—Ulcers healed; appetite good, but child pale; movement of arm fair; deformity of face less, but angle of mouth still pulled down. Sent home, with instructions to exercise arm systematically and to return for further operation.

1871, January 28th.—Brought back to hospital. The parts have contracted considerably, the elbow being flexed nearly to a right angle and the face much drawn down. To-day a second operation was performed on the neck. An incision was made through the cicatrix from behind forwards, the head drawn aside, and the tense subcutaneous bands touched with the knife. The resulting wound measured five inches by three inches. A piece of integument not quite so large was then raised from below the clavicle, having a stalk attached to it at the sternal end; this was turned round and stitched to the edges of the wound, the edges of the subclavicular wound being also approximated. Dressed as before.

February 3rd.—A few stitches have given way, but the parts, nevertheless, look well.

8th.—Sutures removed; flap united by adhesion almost throughout its extent.

18th.—All the parts healed. To-day two incisions were made transversely in front of the elbow, the arm straightened and bandaged to a splint.

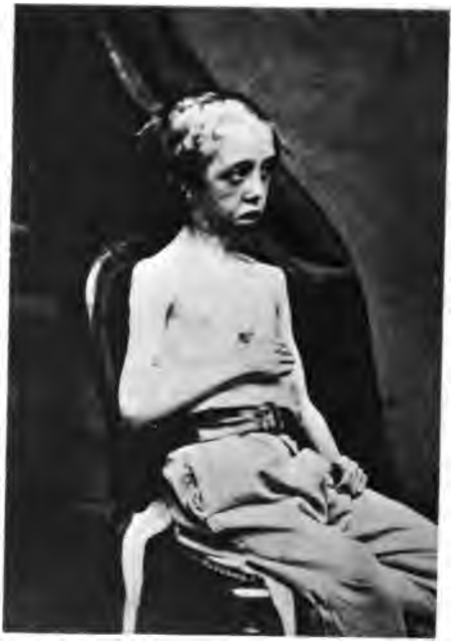
March 11th.—To further improve the condition of the neck the posterior part of the cicatrix was again divided and a flap inserted from the supra-scapular region.

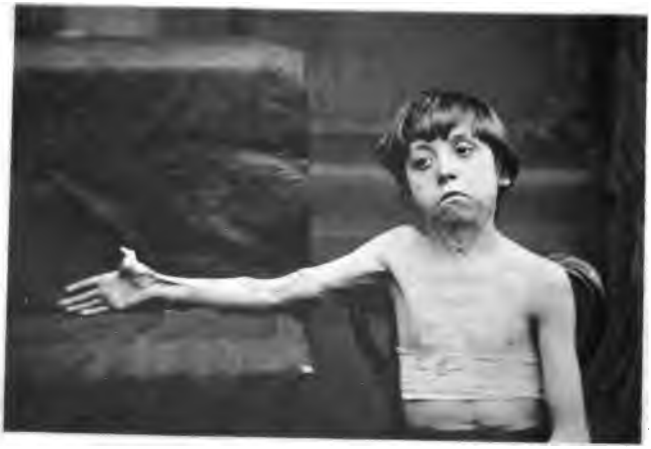
18th.—Stitches removed. Union complete.

25th.—Head to be drawn to left side by means of tapes attached to a gutta-percha coronet. Splint removed from the arm.

April 8th.—Arm perfectly straight; head can be moved fairly well from side to side; rotatory power slight. Dismissed.

1873, October 14th. — Condition very satisfactory. All the transplanted flaps are soft and movable, and in colour scarcely distinguishable; that in front of the elbow is surrounded by a narrow, cord-like elevation, and the power of extension is not quite perfect. The movements of the head are quite free, but when it is directed to the left side the skin is thrown prominently outwards. To make the case as perfect as possible I thought it





would be well to remedy this defect, and to-day I accordingly divided this fold at its lower third and twisted round a flap from the front of the chest, measuring two inches by one. It was dressed as usual, and the arm comfortably bandaged to the chest.

October 23rd.—Sutures removed; union complete; wound on chest wall dressed with boracic lint.

December 15th.—The wound on chest wall has been healed for some time; the condition of the neck and arm is most satisfactory.

CASE II.—Mary Ann R—, æt. 6, admitted August 18th, 1872. Was burnt six months ago by her clothes taking fire. Affected parts: left side of trunk and lower border of ribs, left arm, ear, and side of face and neck. Cicatricial contractions numerous, though the parts principally requiring operation are those at the elbow and posterior fold of the axilla. In the former situation the cicatrix is still of a dull red colour, and consists of a thickening and contraction of the whole skin and subcutaneous tissue in front of the joint. The arm is nearly fixed at a right angle, flexion as well as extension being almost impossible.

August 21st.—Tissues in front of elbow freely divided, including tendon of biceps; one vein ligatured. Complete extension of limb thus effected. A piece of skin two inches square taken from chest, with a broad pedicle attached. Carefully stitched to edges of wound. An oakum pad bandaged on.

September 1st.—Stitches removed; union complete.

11th.—Pedicle divided; a part of the wound on inner aspect of arm remains uncovered; to be allowed to granulate, the arm being kept extended by a splint.

The date of her discharge from hospital was not noted. Fourteen months after the operation the condition of the arm was most satisfactory. Motion was perfect, and the inserted flap and surrounding tissue soft and pliant, except where granulation took place, where the skin was elevated and puckered. The posterior fold of the axilla has not been operated on.

CASE III.—William S—, æt. 10, admitted August 22nd, 1872;

burnt when three years old, through his clothes taking fire. Strong, bridle-like contractions extend over the front of neck from sternum to chin, making traction on lower lip; right ear much disfigured; right elbow is flexed at an acute angle by a broad, web-like band, stretching from the upper part of arm to second joint of thumb; the thumb is drawn backwards and outwards, but all its joints are perfectly movable. (See photograph.)

August 31st.—Free section of cicatrix in front of elbow, extending through the biceps tendon and part of the brachialis anticus, the deeper parts being touched with the knife, as extension of the limb put them on the stretch. The degree of flexion remaining was very slight, and such as it was thought possible to overcome by subsequent extension. Three veins were ligatured. The edges of the wound were brought together longitudinally above and below, and the middle part was fitted with a flap two inches by one taken from the chest. Stitched and dressed as usual.

September 6th.—Stitches in lower part of wound have given way; upper part looking well; flap healthy and adhering.

14th.—Pedicle divided; union favorable; posterior splint applied, while granulation is going on at lower and inner angles of wound.

November 12th.—Dismissed for a few weeks. To return for future operation.

December 21st.—Readmitted. Very slight recontraction of elbow; thumb remains in its original faulty position; transverse section of contraction at wrist, including tendon of extensor primi internodii pollicis. A flap inserted from epigastrium.

1873, January 7th.—Pedicle divided.

February 1st.—Discharged. Though thumb freely movable, its first phalanx remains almost at a right angle to the metacarpal bone, probably owing to an alteration of the joint surfaces.

August 15th.—Came to hospital to-day; arm not satisfactory, there being considerable contraction of the tissues all round the inserted flap. I advised another operation, which was agreed to. The flap was, therefore, cut across, the incision being carried on each side of it through the cicatricial tissue; the arm then became quite straight, and a flap, about two inches by three, was dissected off the chest and fixed to the wound as before; it adhered completely, and the stitches were removed in ten days. Previous experience having shown that recontraction is most apt to occur at the inner side of the arm, where the wound, being uncovered by transplanted tissue, has to heal by granulation, I determined to repeat the operation I had unsuccessfully tried in my first case, viz. to separate the flap from the chest by dissecting off a further piece of skin, which should be attached to the inner angle of the wound on the arm. I therefore allowed four weeks to pass before separating it, in order to secure an abundant vascular supply from the arm to the flap. At the expiry of this time I added to the size of the flap in the manner I have mentioned, and was particularly careful to shave off all granulations from the under surface of the flap and from the uncovered part of the wound on the arm. The flap, being thus separated from the side, was then stitched on to the raw surface, as in previous operations. The new piece thus made available for fitting to the arm was triangular in shape, measuring about one inch by one and a half, and it was sufficient to cover the remaining wound on the arm. It adhered at once, and the stitches were removed in a few days afterwards.

During the autumn a succession of minor operations were performed to improve the appearance of the face and neck. These need not be detailed here.

December 16th.—The condition of the arm (except as regards the thumb) is most satisfactory. The power of extension is perfect. The flap is soft and movable, and the surrounding tissue free from contraction. (See photograph.)

Case IV.—John H—, æt. 4½ years. Admitted September 3rd, 1872. Was burnt on the left arm two months previously. There is a strong and thick cicatrix extending from the middle of the upper arm to the wrist. It is of a dusky red colour, and sheds scales of cuticle. The elbow is almost fixed at a right angle, flexion and extension being both very limited.

September 7th.—Division of cicatrix and adaptation of a flap of skin from the chest, as in previous cases. Two veins ligatured.

30th.—Pedicle divided. Union of flap complete. A considerable portion of the wound on the inner side of the arm remains uncovered.

November 12th.—Made an out-patient. Ulcer still unhealed.

December 20th.—Arm becoming flexed. Readmitted. Posterior splint applied. Healing afterwards progressed very slowly, but was expedited by skin grafting.

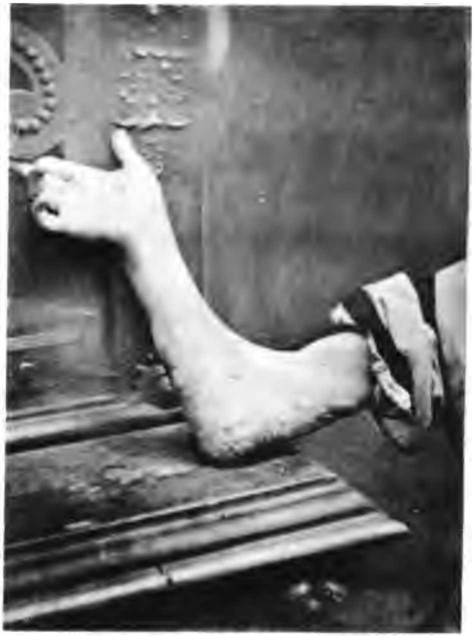
May 24th, 1873.—Parts have been healed for some time; some cicatricial scars have formed on the inner side of the arm; arm nearly straight; movements perfect.

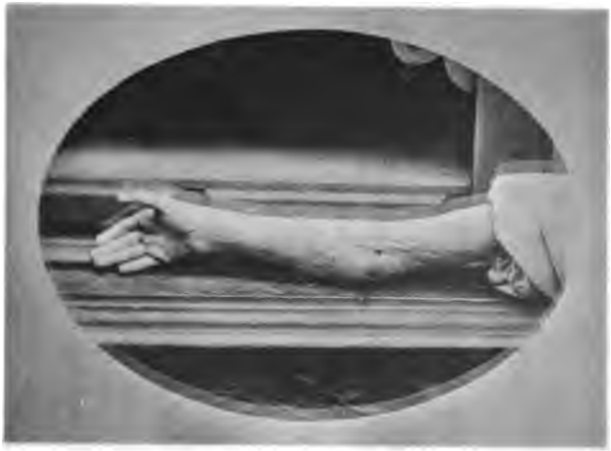
Case V.—Alice T—, æt. 9 years. Admitted June 3rd, 1873. Fell on the fire three years previously, burning both arms. The right, the worse of the two, is shown in the photograph. The rotatory motion of the forearm is very imperfect.

June 5th.—Cicatrix of right arm divided and limb extended. During the process the brachial artery was wounded, and ligatures were applied to both orifices, the ends being cut short. A flap about two inches square was then dissected from the chest, and stitched to the edges of the wound in the usual manner. It filled the gap better than in most of my previous cases, and I succeeded in covering all but the inner apex of the wound. It united well, and the stitches were removed on the 13th. I did not consider it necessary to extend the flap, as in the case of Wm. S—, but after the expiry of three weeks cut directly through the pedicle. A small ulcer thus remained on the inside of his arm. A splint was applied, and the arm was kept straight and at rest.

The left arm was treated subsequently by division of the cicatrix and transplantation of a flap from the adjacent parts, the pedicle being twisted round.

September 27th.—All the wounds have been healed for some weeks. The right arm has also been at liberty for some time. It is all but quite straight, and flexion and extension are performed perfectly. The power of supination, however, is lost, there being





apparently some adhesions about the head of the radius. There is a well-marked scar to the inside of the flap, but all the other parts are soft and pliant. Dismissed. (See photograph.)

The following remarks occur to me from my experience in the above cases:

1. *Division of cicatricial tissue.*—I consider it most important that every band or fibre of this tissue be cut fairly across, however extensive or deep the incision thus required may be. The peculiar action which burns have on the tissues, and the peculiar nature of the scars they occasion, have not yet been well explained. It is well known, however, that the contraction so occasioned is most obstinate. If, therefore, the cicatrix be not first of all divided in its entire extent, and means also be not adopted to keep it from reuniting, an immense amount of trouble will afterwards be occasioned, and after all there will probably be recontraction at the sides of or underneath the transplanted flap. In making the section the tense fibres are easily recognised, either by sight or pressure with the point of the finger, while an assistant keeps the part extended.

2. *Extension of the affected parts.*—It happens sometimes that after the cicatricial tissue has been freely divided the contracted part, such as the elbow, cannot yet be fully extended. This is the more likely to be the case the longer the time which has elapsed since the injury was inflicted, and it is due to an interstitial shortening of the muscles and other soft parts. The more completely the parts are straightened at the time of operating the less will be the subsequent trouble, and the better, probably, will be the result. It is, therefore, important to place the part in a fairly straight position, even should it be necessary to divide muscles and tendons to effect this. Cases I, II, and III show that this may be done in the arm without any injurious effects, and the cases of Mütter show that the sterno-mastoid may equally well be divided. It is to be borne in mind, however, that this division of shortened tissues is by no means essential in the sense that it is to divide the tissue of the cicatrix. To obtain a good result it may be said that the latter is essential, while the former is only auxiliary,

much being possible by gradual extension during the subsequent treatment.

3. *Size and position of flap.*—It is natural to wish to use as small a flap as possible. Here again, however, the more thoroughly the operation is done the less will be the future trouble and the better the result. In Cases I and III I am convinced that some of the flaps were too small. I consider it much more important, however, that the flap should be large in the transverse than in the longitudinal direction. The cicatrix being duly divided and the part extended, it can easily be understood that a piece of skin which has been inserted fairly across the wound, from its outer to its inner angle, even though it be a very narrow strip, will be an obstacle to the reunion of the divided cicatrix; and further, as was ingeniously pointed out by Mr. Carden, that, being united to and acted on by a cicatrix on each side of it, it will have a capability for expansion. If it do not fill up the wound completely, however, in the transverse direction, the divided cicatrix may again unite at the defective part and occasion more or less recontraction. Consequently, I would advise that, when it appears desirable to limit the size of the flap, this limitation should be done at the expense of the length rather than the breadth. All of my cases illustrate the importance of this. It being almost impossible to adapt a flap from the front of the thorax across the front and inner side of the arm, the inner angle of the wound on the arm was always left uncovered, and had to heal by granulation, the result being a considerable scar at the spot and a corresponding degree of contraction. In such a case I think the modification I adopted successfully in the last operation on Case III an important one. In Case I its non-success is to be attributed to the granulations not being properly removed.

Mr. Wood, in the case he has recorded, lays some stress on the importance of attention to the arterial distribution of the part in cutting out the flap. The pedicle, in my cases, however, was always on the sternal side of the latter, so that as regards the chest wall, at all events, the point would not appear to be an important one.

4. As regards *division of the pedicle,* it will be seen that I left

it untouched for three weeks, and that I then divided it partially or altogether. In no case did any sloughing ensue. In no case either was any irksomeness from restraint complained of.

5. *Adhesion of the flap.*—Mr. Holmes remarks* that "it is hopeless to expect primary union where the edge of the cleft has more or less the character of a cicatrix." This opinion I cannot altogether assent to, for, although I cannot affirm that in any case complete union of the flap took place by primary adhesion, still this certainly did occur as regards the greater part of its extent in every case, pus being formed only at a few points, mostly in the track of the sutures. In every case I was satisfied that union of the under surface of the flap to the underlying tissue was accomplished in the former manner. I believe it is important, for this end, to take all tension off the parts by flexing the limb. But even if adhesion take place to a great extent by granulation, it does not on that account appear that the risk of recontraction is much greater, provided always that the original cicatrix has been fairly divided and the cut ends separated, and also that extension is kept up sufficiently long. It is more probable that relapses will occur from the parts insensibly returning to a position approximating that they have been so long habituated to than from the formation of new inodular tissue.

6. *Ligature of vessels.*—It will be observed that I used carbolated ligatures and cut them short. No further mention is made of them, for the very sufficient reason that no more was seen of them. I have found that silk, which, it is to be remembered, is an animal tissue, is, in this respect, quite as serviceable as catgut.

I trust that these cases may serve to show that freer attempts may be made to relieve a very deplorable class of affections. I have sometimes thought that, failing the practicability of obtaining sound skin from the patient himself, it might be possible to do so, in a similar manner, from a second person.

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* 'Surg. Treat. of Children's Diseases,' p. 278.

STATISTICS OF MAJOR OPERATIONS

PERFORMED AT THE

MANCHESTER ROYAL INFIRMARY,

FROM JUNE 1872 TO JUNE 1873.

COLLECTED BY T. JONES, ESQ., M.B.,
PATHOLOGICAL REGISTRAR.

Lithotomy.

Sex.	Age.	Recovered.	Died.	Remarks.
M.	...	1	...	
M.	10	1	...	Urine passed naturally on the second day.
M.	...	...	Three days afterwards	Acute bronchitis supervened.
M.	58	1	...	Rectum injured; quickly healed.
M.	33	1	...	Two calculi removed.
M.	15	1	...	
M.	39	1	...	
M.	9	1	...	Ninth day, micturated in the natural way.
M.	17	1	...	Edge of incision torn by calculus, which was of a peculiar shape.

Total results—9 operations; 8 recoveries, 1 death (acute bronchitis).

Ligature of arteries.

Sex.	Age.	Vessel tied.	Cause of operation.	Result.	Remarks.
M.	36	Femoral	Popliteal aneurism	Cured	Catgut ligature used.
M.	30	Femoral	......	...	......
M.	47	...	......	...	......

Total results—3 arteries tied, 3 successful.

Ovariotomy.

<table>
<tr><th>Age.</th><th>Kind of tumour.</th><th>Operation.</th><th>Discharge.</th></tr>
<tr><td>28</td><td>Multilocular</td><td>May 23</td><td>June 21, cured.</td></tr>
<tr><td>54</td><td>Unilocular</td><td>May 23</td><td>June 21, cured.</td></tr>
<tr><td colspan="4">Clamp used to secure pedicle in the above cases.</td></tr>
<tr><td>35</td><td>Multilocular</td><td>April 11</td><td>May 22, cured.</td></tr>
<tr><td>37</td><td>Multilocular</td><td>August 1</td><td>September 11, cured.</td></tr>
<tr><td colspan="4">The pedicle tied with strong catgut and returned within the abdominal cavity.</td></tr>
</table>

Hernia.

Age.	Sex.	Kind.	Period of strangulation.	Operation.	Result.
53	F.	Femoral	5 days	Herniotomy	Death.
59	M.	Do.	4 days	Do.	Cured.
50	F.	Do.	56 hours	Do.	Death (peritonitis).
24	M.	Inguinal	...	Do.	Death.
30	F.	Femoral	...	Do.	Cured.
47	M.	Inguinal	52 hours	Do.	Death (gangrene of bowel).
15	M.	Dble. cong., inguinal	...	Operation for radical cure	Relieved.
45	F.	Femoral	10 hours	Herniotomy	Cured.
72	M.	Inguinal	2 days	Herniotomy, sac opened	Death.
59	F.	Femoral	48 hours	Do.	Do.
39	M.	Inguinal	20 hours	Do.	Do.
70	F.	Femoral	10 hours	Do.	Death, 47 days (bronchitis).
28	M.	Inguinal	3½ days	Do.	Cured.
66	F.	Femoral	10 hours	Do.	Death (rup. bowel).
48	F.	Femoral, incarcerated	...	Stricture divided.	Cured.

Total results—Number operated upon 15; recoveries 5, deaths 9, relieved 1.

Excisions.

Sex.	Age.	Joint resected.	Result.	Remarks.
M.	58	Wrist	Useful hand	
F.	18	Knee	Death, exhaustion	
M.	9	Elbow	Good	
M.	29	Knee	Subsequent amputation of thigh	No attempt at union.
F.	18	Wrist	Relieved	Several pieces of bone removed afterwards.
M.	12	Knee	Firm union	Six months afterwards.
F.	19	Elbow (partial)	Useful arm	
M.	9	Wrist	Useful hand	Treated antiseptically.
F.	20	Shoulder	Partial relief	More dead bone.
M.	7	Shoulder	Good	

Total results—10 excisions; knee 3, shoulder 2, elbow 1, elbow (partial) 1, wrist 3. 1 Death from exhaustion. 1 Subsequent amputation.

Amputations of breast.

Age.	Kind of tumour.	Operation.	Result.
29	Recurrent scirrhus	June 14	Healed.
46	Sero-cystic disease	July 26	Dressed antiseptically; return of disease.
53	Recurrent scirrhus	Aug. 2	Made out-patient August 26.
59	Scirrhus	Sep. 12	Healed September 30; subsequent return; death.
54	Recurrent scirrhus	Oct. 16	Made out-patient October 31.
—	Do.	Nov. 1	Made out-patient November 28.
34	Scirrhus	Nov. 8	Healed November 21.
45	Do.	Nov. 9	Healed December 12.
35	Do.	Nov. 15	Made out-patient December 9.
55	Do.	Dec. 20	Healed January 9.
48	Do.	Jan. 3	Healed January 30.
24	Fibroid tumour	Jan. 3	Healed January 14.
45	Scirrhus	Feb. 2	Healed February 22.
47	Do.	Feb. 8	Healed February 24.
46	Do.	Feb. 22	Nearly healed March 20.
47	Fibro-cystic	Feb. 28	Nearly healed April 17.
52	Scirrhus	Mar. 7	Healed April 17.
44	Fibro-cystic	March 7	Healed March 29.
...	Scirrhus	March 28	Nearly healed April 24.
33	Do.	May 10	Healed June 14
45	Do.	May 24	Nearly healed June 17.

AMPUTATIONS.	Total.	Primary for Accident.		Secondary for Accident.		Secondary for Disease.		PRIMARY FOR ACCIDENT.																SECONDARY FOR ACCIDENT.																SECONDARY FOR DISEASE.															
		Recoveries.	Deaths.	Recoveries.	Deaths.	Recoveries.	Deaths.	RECOVERIES.								DEATHS.								RECOVERIES.								DEATHS.								RECOVERIES.								DEATHS.							
								Sex.		Ages.						Sex.		Ages.						Sex.		Ages.						Sex.		Ages.						Sex.		Ages.						Sex.		Ages.					
								Male.	Female.	Under					60 & above.	Male.	Female.	Under					60 & above.	Male.	Female.	Under					60 & above.	Male.	Female.	Under					60 & above.	Male.	Female.	Under					60 & above.	Male.	Female.	Under					60 & above
										10	20	30	40	50				10	20	30	40	50				10	20	30	40	50				10	20	30	40	50				10	20	30	40	50				10	20	30	40	50	
Forearm	11	5	...	1	...	4	1	5	...	...	1	...	3	1	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	2	2	...	...	...	1	1	2	1	...	...	...	...	1	...	...
Arm	18	9	3	3	1	2	...	9	...	...	2	2	2	2	1	3	...	...	1	1	...	1	...	3	...	...	...	1	1	1	...	1	...	...	...	1	...	...	...	1	1	...	...	...	2	...	...	...	...	...	...	...	...	...	...
Shoulder-joint	4	...	...	2	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	2	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...
Foot	10	1	...	...	...	9	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	4	...	9	...	...	...	...	...	...	...	...	...	...	...	...
Leg	13	2	2	2	1	5	1	2	...	...	...	...	2	...	...	2	...	...	...	2	...	...	...	1	1	...	...	...	...	1	1	1	...	...	...	...	...	...	1	3	2	1	2	...	1	...	1	1	...	...	1	...	...	...	...
Thigh	18	3	3	3	...	7	2	3	...	...	3	...	...	...	...	3	...	...	...	2	...	...	1	2	1	...	1	1	...	...	1	...	...	...	...	...	...	...	...	6	1	...	1	4	1	...	1	1	1	...	...	...	1	1	...
Hip-joint	4	...	1	...	...	2	1	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	2	...	...	...	...	1	...	...	1	...	...	...
	78	20	9	11	3	29	6																																																

Tabular View of the Major Operations performed in the Royal Infirmary, Royal Southern and Northern Hospitals, in Liverpool, during the year 1872.

		Royal Infirmary.		Royal Southern Hospital.		Northern Hospital.	
		Recovered.	Died.	Recovered.	Died.	Recovered.	Died.
Excision of the shoulder-joint		1	...	...	...	...	...
„ „ elbow-joint		5	...	...	...	...	...
„ „ wrist-joint		1	...	...	...	...	...
„ „ hip-joint		1	...	...	...	...	...
„ „ knee-joint		...	...	...	1	1	1
„ „ upper jaw		4	...	...	...	...	...
„ „ whole tongue		2	...	1	...	...	...
Amputation of the arm	primary	...	...	...	...	5	...
	secondary	...	...	1	...	...	...
„ of the forearm	primary	3	...	...	...	3	...
	secondary	1	1*	...	...	2	...
„ „ hand	primary	2	...	1	1	1	...
	secondary	...	...	...	...	...	...
„ „ thigh	primary	2	2†	...	...	1	1§
	secondary	7	2‡	1	1	1	1
„ „ leg	primary	3	...	1	...	5	...
	secondary	2	...	2	...	1	1‡
„ „ foot	primary	1	...	1	...	...	...
	secondary	11	1†	3	...	1	...
Operation for ununited fracture		3	...	...	...	...	...
Lithotomy		3	...	...	...	1	...
Lithotrity		5	...	...	...	...	...
Ligation of femoral artery		2	...	...	...	...	...
„ „ gluteal artery		1	...	...	...	...	...
Herniotomy		4	2	...	2	1	1
Perinæal section	for disease	2	...	...	...	...	...
	for injury	3	1	...	...	...	...
Paracentesis thoracis		3	1	...	1	1	1
„ „ abdominis		6	...	...	2	3	...
Laryngotomy		...	1	...	...	...	...
Tracheotomy		1	2	...	...	...	1
Extirpation of mamma		11	...	...	...	...	...
„ „ eyeball		...	...	1	...	...	...
„ „ tumours		15	4	3	...	2	...
Holt's operation		3	...	5	...	...	...
Removal of diseased bone		4	...	8	...	11	...
„ „ loose cartilages		...	1	...	...	...	...
Ovariotomy		...	2	1	1	...	...
Trephining		1	...	4	2	1	1
Plastic operation		1	...	...	...	...	...
Plastic operation for vesico-vaginal fistula		3	...	...	...	...	...
Removal of prostatic calculus		1	...	...	...	...	...
Urethrotomy for a calculus		...	...	1	...	...	...
Radical cure for hydrocele		...	...	1	...	...	...

* Died of phthisis.

† Died of pyæmia.

‡ Died of exhaustion.

§ Died of shock.

NB 641

NB 641